



2006 11th Expeditionary Warfare Conference
“Joint Expeditionary Operations in an Uncertain World”
Panama City, FL

23-26 October 2006

Onsite Agenda

Tuesday, 24 October 2006

Joint Expeditionary Operations in an Uncertain World by MG Thomas Benes
Relevant Research and Results.... Yesterday, Today, and Tomorrow by Rear Admiral William Landay III
Aviation Update by MG Virgil L. Packett II
Combating Terrorism Technology Support Office by Mr. Edward McCallum

Technology Challenges in an Uncertain World by BG Randolph Alles
Counter-IED RESPONSE IN THE GWOT “Technology Transition for the Current War” by RDML Archer M. Macy
Air Force Engagement in Expeditionary Warfare by BG Kevin Henabray

Wednesday, 25 October 2006

AEGIS – Ballistic Missile Defense by Rear Admiral Buzz Buzby
NDIA Brief 2006 by CAPT Eugene Gray
Navy Expeditionary Combat Command Navy Expeditionary Combat Command by CAPT John Sturges

Recapitalizing the Navy's Battle-Line by CDR Greg Gombert

Force Structure UnCertainty by VADM Terry Etnyre

We are Ships from Cradle to Grave by RADM Charles Hamilton

Force Structure Uncertainty by Mr. James E. Thomsen

Sea Control and Expeditionary Power Projection by BG Thomas L. Conant

Monday, October 23, 2006

8:00 a.m.	Annual Golf Tournament-Shotgun Start Sponsored by Northrop Grumman Ship Systems	Nicklaus Golf Course
3:00 p.m. - 7:00 p.m.	Early Registration	St. Andrew's Foyer
3:00 p.m.	Cyber Café Opens	Spanish Moss "A"
3:00 p.m. - 4:30 p.m.	Spouse Welcoming Tea Spouses are invited to get acquainted and plan their activities during the conference (Please register your spouse for this complimentary event)	Palms Court Terrace
6:00 p.m. - 7:00 p.m.	Reception Sponsored by AVW Technologies	Display Area
7:00 p.m. - 9:00 p.m.	Dinner Guest Speaker: Lieutenant General James F. Amos, USMC Commanding General, Marine Corps Combat Development Command	Grand Lagoon Ballroom

Tuesday, October 24, 2006

Opening Session

6:30 a.m.	Registration	
6:30 a.m.	Continental Breakfast Sponsored by ARINC	Display Area
7:30 a.m. - 8:00 a.m.	Welcome and Opening Remarks Mr. Duane Covert, Northrop Grumman MS, NDIA EWC Chairman Rear Admiral Steven G. Smith, USN (Ret), ViaGlobal Group, LLC, Chairman, EW Division Lieutenant General Lawrence P. Farrell, Jr., USAF (Ret), President and CEO, NDIA Captain Andrew Buduo, USN, Commanding Officer, Naval Surface Warfare Center, Panama City	St. Andrews
8:00 a.m. - 8:45 a.m.	Major General Thomas Benes, USMC, Director, Expeditionary Warfare Division, OPNAV N85	
8:45 a.m. - 9:30 a.m.	Brigadier General Robin Swan, USA, Army Capabilities Integration Center, TRADOC	
9:30 a.m. - 10:00 a.m.	Break Sponsored by Lockheed Martin	
10:00 a.m. - 10:45 a.m.	USAF Speaker TBD	
10:45 a.m. - 11:30 a.m.	General Robert Magnus, USMC Assistant Commandant of the Marine Corps	
11:30 a.m. - 12:45 p.m.	Networking Luncheon	Grand Lagoon Ballroom
12:45 p.m. - 1:30 p.m.	Lieutenant General Jan Huly, USMC, Deputy Commandant, Plans, Policy and Operations, Headquarters, USMC	

Technology Challenges in an Uncertain World

Session Chairman: Mr. Michael Janay, AFM-USA, Inc.

Session Focus: The challenges and issues facing Joint and Coalition Forces in Iraq and Afghanistan, where insurgents operate outside established warfare parameters, require an immediate and concerted effort to find technological solutions. This session will focus on DoD strategies and industry opportunities to mitigate and eliminate the threats in the current Global War on Terror and the uncertain future world.

1:30 p.m. - 2:00 p.m.	Keynote Speaker: Rear Admiral William Landay, USN, Chief of Naval Research	
2:00 p.m. - 3:15 p.m.	Panel Members: Major General Virgil L. Packett, II, USA, Commanding General, US Army Aviation Warfighting Center Mr. Edward McCallum, Technical Support Working Group Brigadier General Randolph G. Alles, USMC, Commanding General Marine Corps Warfighting Lab Rear Admiral Arch Macy, USN, Commander, Naval Surface Warfare Center Moderated by: General Al Gray, USMC (Ret)	
3:15 p.m. - 3:45 p.m.	Break Sponsored by Austal USA	
3:45 p.m. - 4:30 p.m.	Panel Question and Answer period Evening Free	

Wednesday, October 25, 2006

6:45 a.m. - 7:30 a.m.

Continental Breakfast
Sponsored by BAE Systems

Display Area

7:30 a.m. - 8:15 a.m.

Vice Admiral John G. Morgan, USN, Deputy CNO for Information, Plans and Strategy (N3/N5)

8:15 a.m. - 8:30 a.m.

Short Break

Warfighting Challenges in the Littorals

Session Chairman: Rear Admiral Dennis Conley, USN (Ret), Strategic Insight

Session Focus: Joint Warfighting in the littoral requires the application of multi-dimensional offensive and defensive capability on and above the sea, on and over land, and below the sea surface. This session will focus on the challenges and issues facing Joint Forces in the development and deployment of integrated capability to conduct combat operations in the littoral including operations in river deltas, near coastal areas, and the introduction of expeditionary ground and air forces into areas of uncertainty. We will include discussion of harbor and coastal defense, mine warfare, Marine Corps operations, Integrated Air and Missile Defense and the connection of these operations to overall global maritime and littoral dominance in the protection of the U.S.

8:30 a.m. - 9:15 a.m.

Keynote Speaker:

Rear Admiral Jack Hines, USN, Deputy Commander, THIRD Fleet

9:15 a.m. - 10:15 a.m.

Panel Presentations:

Brigadier General Joseph F. Dunford, Jr., USMC, Director, Operations Division, Plans, Policy and Operations, HQ USMC

Rear Admiral Buzz Buzby, USN, Deputy Director, Surface Warfare Division, OPNAV N86B

Captain Eugene Gray, USCG, Chief of Security and Defense Operations, Coast Guard Headquarters

Captain John Sturges, USN, Commander Navy Coastal Warfare Group ONE/Navy

Expeditionary Combat Command (NECC) Representative

Moderated by: Major General Harry Jenkins, USMC (Ret)

10:15 a.m. - 10:45 a.m.

Break

Sponsored by Sonar Systems a DRS/Thales Company

10:45 a.m. - 11:30 a.m.

Panel Question and Answer period

11:40 a.m. - 1:15 p.m.

Lunch Speaker:

The Honorable Donald C. Winter
Secretary of the Navy

Force Structure Uncertainty

Session Chairman: Rear Admiral Bill Fogarty, USN (Ret), BAE Systems

Session Focus: To address the Issues and Challenges associated with Force Structure that are/will be facing decision-makers as we face uncertainties, both as regards threats to our country and fiscal restraints. "What is the right Force mix, and can we afford it?" That is the question we will explore in this session.

1:30 p.m. - 2:15 p.m.

Keynote Speaker:

Vice Admiral Terrance T. Etnyre, USN, Commander, Naval Surface Forces

2:15 p.m. - 3:15 p.m.

Panel Members:

Rear Admiral Charles Hamilton, USN, Program Executive Officer SHIPS

Mr. James E. Thomsen, Program Executive Officer Littoral and Mine Warfare

Ms. Jo Decker, Assistant Deputy CNO for Integration of Capabilities and Resources, OPNAV N8B

Brigadier General Thomas Conant, USMC, Assistant Deputy Commandant for Combat Development

Moderated by: Rear Admiral Bill Fogarty, USN (Ret), BAE Systems

3:15 p.m. - 3:45 p.m.

Break

Sponsored by Triton Services

3:45 p.m. - 4:30 p.m.

Panel Question and Answer Period

4:45 p.m.

First bus departs for NSWC PC

5:00 p.m. - 7:00 p.m.

NSWC PC Open House

Networking Reception

Sponsored by EDO Corporation & Raytheon Corporation

7:00 p.m. - 10:00 p.m.

Pig Roast

10:00 p.m.

Last bus departs NSWC PC for Bay Point Marriott

Thursday, October 26, 2006

6:45 a.m. - 7:45 a.m.

Continental Breakfast
Sponsored by **The Boeing Company**

Display Area

7:45 a.m. - 8:30 a.m.

Rear Admiral Mike Lefever, USN, Former Commander Expeditionary Strike Group One and CJTF Disaster Assistance Pakistan

Joint Interoperability of Unmanned Systems in Expeditionary Warfare

Session Chairman: Mr. Skip Gaskill, AAI Corporation

Session Focus: With the rapid growth of both Joint and Service unique requirements for Unmanned Systems and with the uncertainties of an ever-changing world, it is imperative that DoD and Industry focus on the challenges of meeting those requirements while keeping in mind the requirements for interoperability. This session will focus on both Joint and Service unique requirements, current developmental efforts, and interoperability challenges of Unmanned Air, Ground, Surface, and Subsurface Systems.

8:30 a.m. - 9:15 a.m.

Keynote Speaker:

Mr. Barry Dillon, Executive Director, Marine Corps Systems Command

9:15 a.m. - 9:55 a.m.

Presentations:

Lieutenant Colonel Jennifer Jensen, USA, Program Manager One System Ground Control Station (OSGCS)

Colonel Frank Kelly, USMC, Program Manager Unmanned Systems, Marine Corps Systems Command

9:55 a.m. - 10:25 a.m.

Break

Sponsored by **Maersk Line, Limited**

10:25 a.m. - 11:05 a.m.

Presentations:

Colonel Terry Griffin, USMC, Joint Program Office, Unmanned Ground Systems

Lieutenant Colonel Steven Tanner, USAF, Doctrine/Training Division Chief, Joint Unmanned Aerial Systems Center of Excellence

Moderated by: Mr. Helmut Portmann, Deputy Product Area Director, Littoral and Mine Warfare

11:05 a.m. - 11:50 a.m.

Panel Question and Answer period

11:50 a.m. - 12:00 p.m.

Closing Remarks

12:00 p.m.

Lunch

CONFERENCE ADJOURNS UPON COMPLETION OF LUNCH

12th Annual Expeditionary Warfare Conference

October 22 - 25, 2007



Technology Challenges in an Uncertain World

*Commanding General, Marine Corps
Warfighting Lab*

Vice Chief of Naval Research

BGen Randolph Alles

www.mcwl.quantico.usmc.mil

24 October 2006



Mission

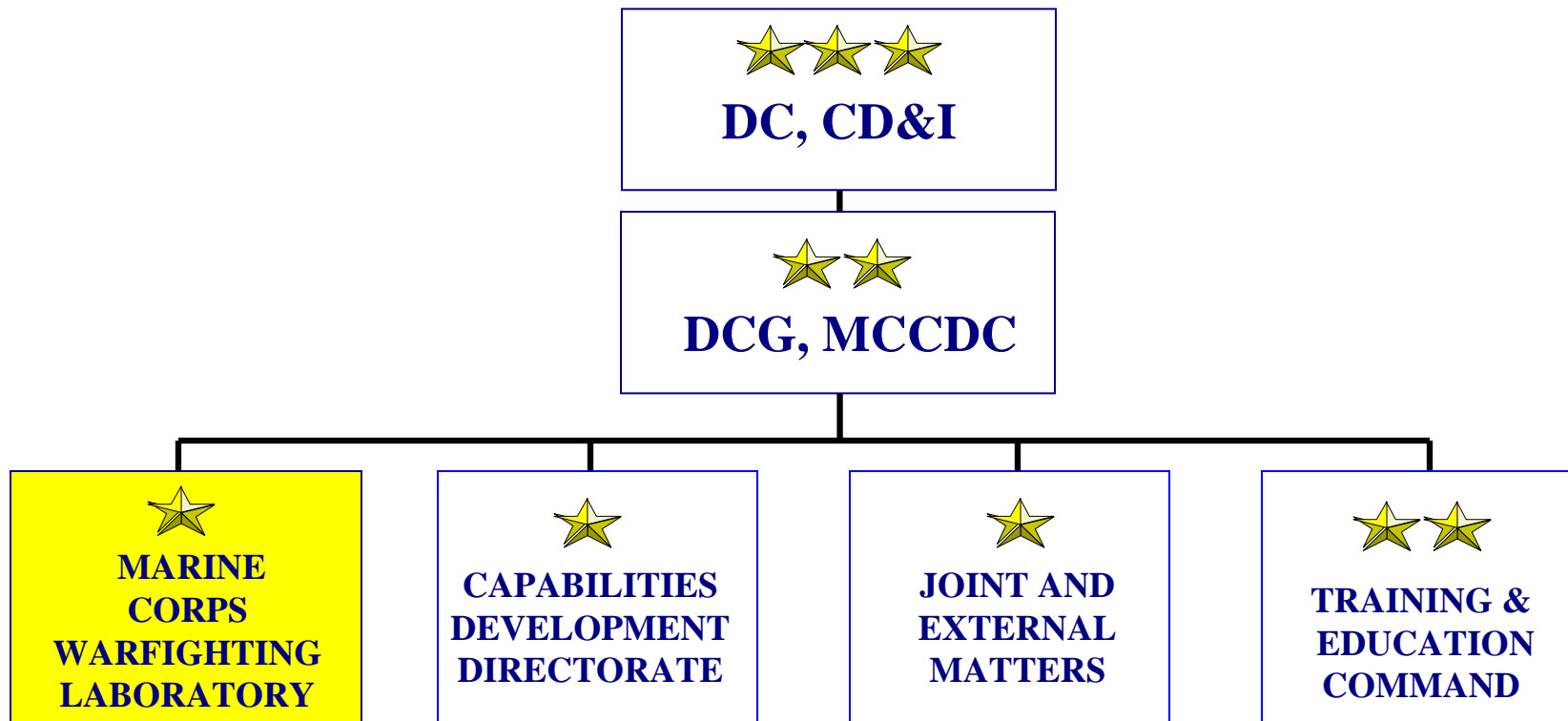


The Lab develops **concepts**, conducts *concept-based experimentation* to develop and evaluate *tactics, techniques, procedures and technologies* in order to enhance Marine Corps warfighting capabilities.





Integral Part of the Combat Development Enterprise



The Lab CG is also Vice Chief of Naval Research,
Executive Agent for S&T, and EA for Tech Support to OIF/OEF



Experimentation Continuum



The Three Worlds of Innovation and Transformation



Solving Immediate
Problems



The Next Service
4-5 years



The Service
After Next
10-15 years

*Marine Corps Experimentation and S&T
supports Naval Transformation Roadmap*



Tactical Experimentation



***Current Emphasis:
Distributed Operations***



Distributed Operations (Challenges)



- Sustainment / Logistics
 - Distance / Threat / Concealment
- CASEVAC
 - Distance / Threat / Golden Hour
- Communications
 - Reliable / Global / Weight / Batteries
- Training
 - Use of Simulation



Technology Priorities Conceptually



- Make our *small units dominant*, akin to our aviation at 15K feet or our Navy on the high seas
- Consider the *Marine as a part of a system*, so we don't just concentrate on giving an individual the best gear, but gain synergy (comms, jammers, ISR, etc.) from the system
- Find and avoid minefields by their *anomalies*.
- Strengthen our ability to sensitize our troops to *cultural and language* capabilities – enable the human interface



Technology Priorities Specific Targets



- *Achieve persistent, focused ISR over the battlespace.*
- Find and predetonate improvised explosive devices.
- **Halve the weight of the basic fighting load of the infantryman**
- Incorporating common electrical power without the variety of short life batteries
- **Make infantrymen bulletproof and climatically controlled within ten years**
- A helmet with a pilot-like HUD containing optics, protection, data display & comms
- A day/night scope for infantry weapons
- Simulators that approximate the real conditions for squads are needed
- Combat identification of friendly forces and easily position location information read/transmitted in real time and displayed.
- EMP shielding and chem-bio protection
- Adaptive camouflage that conforms to the environment and light conditions.



Wasp Micro UAS

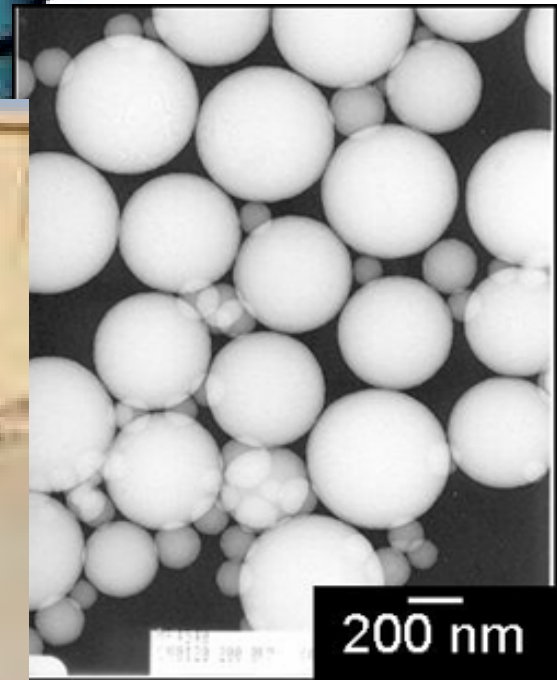
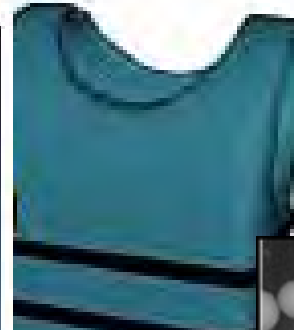


- DARPA funded Micro Air Vehicle
- Platoon Leader's "Binoculars forward"
- 4-5 Km -- 1 Hour Duration
- 35 WASP Systems over 18 months (137 Air Vehicles)
- Validation of requirement anticipated Summer 06
- Controlled insertion of technology into forward deployed units





Improved Personnel Armor



Problem remains
the accumulative
weight



Lighten the Load



- Basic Combat Load:
 - Armor
 - Ammo, food, water
 - Environmental protection
 - *Power source!*
- Every infantryman a seat?
- Exoskeleton?
- Squad equipment carrier (UGV)?





Big Dog Robotic Quadruped



- DARPA funded Robot
- Squad Leader's "Pack Mule"
- 4 MPH (10 MPH goal)
- 2 Prototypes over 18 months
- Incorporated into DO experiments
- USMC partnering with **DARPA** to set expectation of capabilities
- **Demo of mobility on Quantico's hill trail in summer 07**



Exploring concept of a Big Dog 81mm Mortar Carrier



Industry Participation



- What can industry do?
 - Respond to our requests – RFIs / BAAs
 - Respond to our needs (capability gaps) – both known and unknown
- Don't wait for us!
 - Bring your ideas to us!
 - Familiarize yourself with current and future concepts
 - We are open to your ideas, planned products, briefs, presentations.



Distributed Operations

Vehicle Armor Weight

Body Armor

QUESTIONS?

Counter IED

Persistent Surveillance

Non-lethal

Ground Simulation

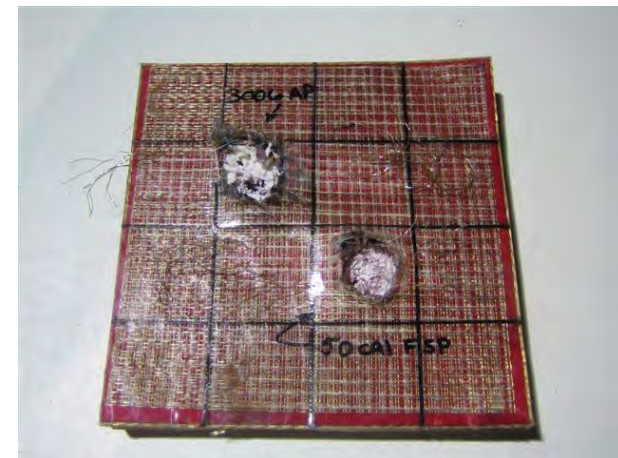
Reduce the number of radios / weight



Vehicle Composite Armor



- Greater Protection
- Lighter
- Affordable
- Adaptable





X-Files--After Action Reports



Marine Corps Warfighting Laboratory

Millennium Dragon 02 (MD 02)



Experiment After Action Report

To improve Naval expeditionary warfighting capabilities across the spectrum of conflict for current and future operating forces.

30 July – 12 August 2002

Marine Corps Warfighting Laboratory

Project Metropolis Tactical Warrior Experiment: Phase Two Guam, USA



To improve Naval expeditionary warfighting capabilities across the spectrum of conflict for current and future operating forces.

Squad Advanced Marksman (SAM) Experiment After Action Report

January 2003



XM326 120MM Mortar System



- Tested with C-RAM system at Yuma
- Just completed 192 rounds fired
- Achieved 58 second (end-to-end missions)
- Less than 15m CEP



Counter Rocket and Mortar

- Follow-on to current effort
- Networked Radars
- Mobile platform
- LAV(M) w/XM 326
- AFATDS compatible
- Just completed 192 rounds
- Achieved 58 second (end-to-end missions)
- Less than 15m CEP



Mobile C-RAM



Counter-IED RESPONSE IN THE GWOT

“Technology Transition for the Current War”

RDML Archer M. Macy, USN
Commander, Naval Surface Warfare Center
23 October 2006

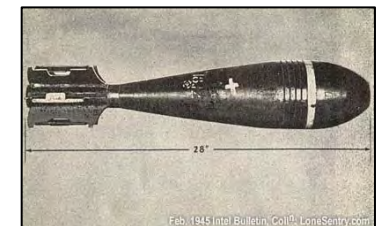
Historical Context



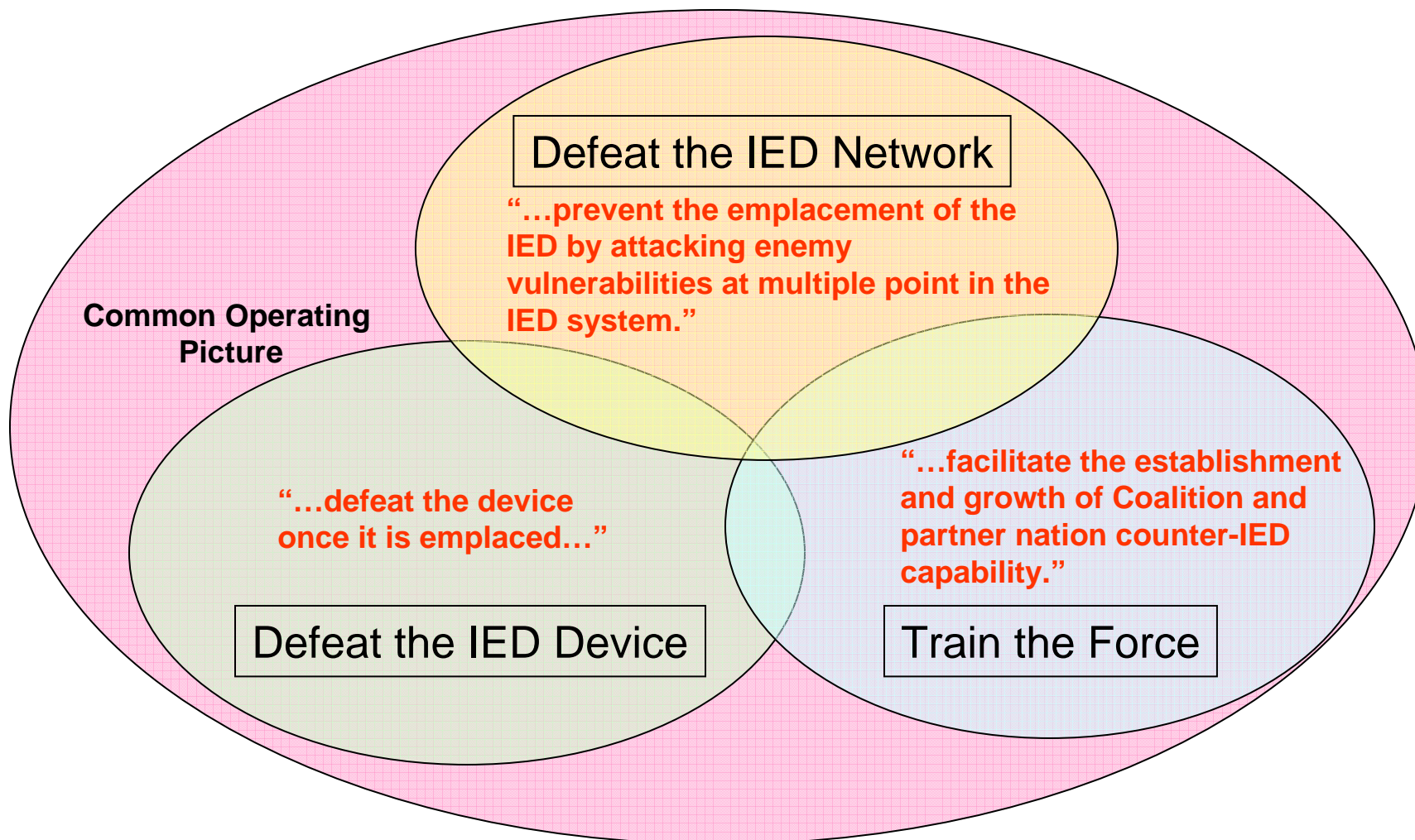
	% Artillery & Mortar	WIA:KIA
Vietnam	36% KIA, 65% WIA	2.6:1
Korea	44% KIA	3:1
WWII	46% KIA	2:1



OIF/OEF
52% Casualties from IEDS
WIA:KIA 9:1

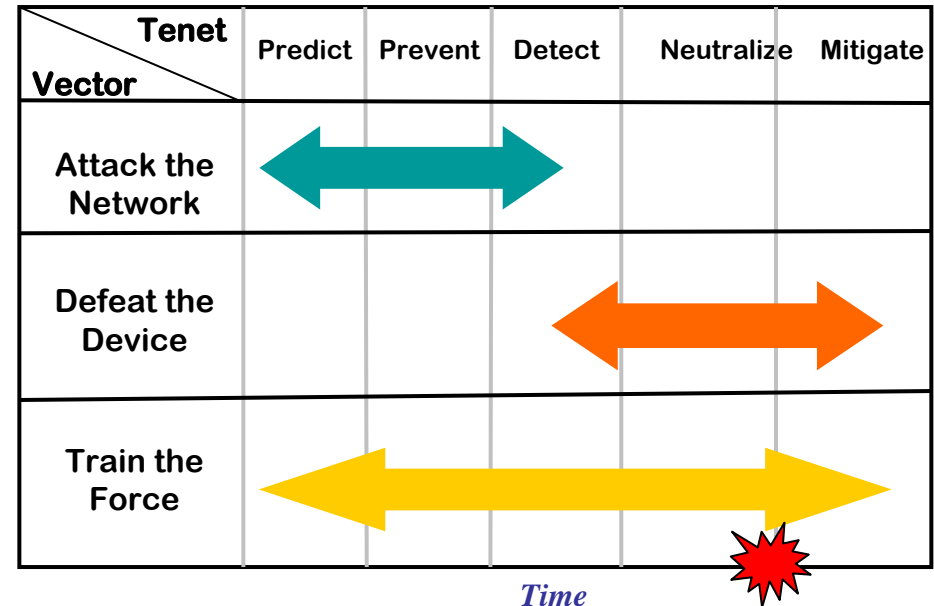


DoD C-IED Overall Approach



Tenets of IED Defeat

- Predict
- Prevent
- Detect
- Neutralize
- Mitigate





Categories of Actions in C-IED

- **Predict:** Activities that integrate intelligence to contribute to a clearer understanding of enemy personnel, equipment, infrastructure, Tactics/Techniques/Procedures, support mechanisms or other actions in order to forecast specific enemy IED-focused operations directed against US interests.
- **Prevent:** Actions that offensively target, interdict, and eliminate key enemy personnel, infrastructure, logistics capabilities, and enemy combat operations involving IEDs. Activities that destroy bomb-makers and their supporting networks, disrupt the IED chain of events prior to emplacement, and deter public support for the enemy's use of IEDs.
- **Detect:** Activities to identify and locate enemy personnel, explosives devices and their component parts, equipment, logistics operations and infrastructure in order to provide accurate and timely information to military operations and planners.
- **Neutralize:** Activities to eliminate the hazards of enemy IEDs by destroying them or rendering them incapable of detonating at the time/place of the enemy's choosing.
- **Mitigate:** Protect personnel, equipment, facilities and infrastructure from the effects of IEDs.



Required Characteristics

- **Agility** – adapt at a rate faster than the opponent
- **Responsiveness** – meet the situation that is – not what we wish it to be
- **Interoperability/Compatibility** – provide solutions that don't –
 - Worsen another situation
 - Create a new opportunity for the enemy
- **Timeliness** – get it there for today's fight



JIEDDO

“The JIEDDO shall focus (lead, advocate, coordinate) all Department of Defense actions in support of the Combatant Commanders and their respective Joint task Forces’ efforts to defeat Improvised Explosive devices as weapons of strategic influence.”



Department of Defense DIRECTIVE

NUMBER 2000.19E

DA&M

SUBJECT: Joint Improvised Explosive Device Defeat Organization (JIEDDO)

References: (a) Title 10, United States Code
(b) Deputy Secretary of Defense Memorandum, “Establishment of the Joint Improvised Explosive Device Defeat Organization (JIEDDO),” January 18, 2006
(c) DoD Directive 2000.19, “Joint Improvised Explosive Device (IED) Defeat,” June 27, 2005 (hereby canceled)
(d) DoD Directive 5105.18, “DoD Committee Management Program,” February 8, 1999
(e) through (k), see Enclosure 1

1. REISSUANCE AND PURPOSE

Under the authority vested in the Secretary of Defense by section 113 of Reference (a) and consistent with Reference (b), this Directive:

- 1.1. Changes the name of the Joint Improvised Explosive Device Defeat Task Force to the Joint Improvised Explosive Device Defeat Organization (JIEDDO).
- 1.2. Reissues Reference (c) to establish the JIEDDO as a joint entity and jointly manned activity of the Department of Defense (DoD) with the mission, responsibilities, functions, relationships, and authorities as prescribed herein.
- 1.3. Establishes a JIEDD Senior Resource Steering Group (SMSG), a JIEDD Integrated Process Team (JIPT), a JIEDD Systems Integration Board (JSIB), a JIEDD Resource and Acquisition Board (JRAB), a JIEDD Lab Board (JLB), and a JIEDD Test Board (JTB), as defined in Enclosure 2 and consistent with Reference (d) and DoD Directive 5105.4 (Reference (e)).
- 1.4. Designates the Secretary of the Army as the DoD Executive Agent (EA) for the JIEDDO, in accordance with DoD Directive 5101.1 (Reference (f)), to provide primary administrative support as defined in Enclosure 3.



Navy Exec Agent for CREW

“It is DoD policy that the DoD CREW technology program provide the most effective countermeasures against radio-controlled improvised explosive devices and improve the efficiency and economy of CREW capability development throughout the Department of Defense by eliminating duplication and overlap of effort.”



DEPUTY SECRETARY OF DEFENSE

1010 DEFENSE PENTAGON
WASHINGTON, DC 20301-1010

MAY 24 2006



MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
CHAIRMAN OF THE JOINT CHIEFS OF STAFF
UNDER SECRETARIES OF DEFENSE
ASSISTANT SECRETARIES OF DEFENSE
GENERAL COUNSEL OF THE DEPARTMENT OF DEFENSE
DIRECTOR, OPERATIONAL TEST AND EVALUATION
INSPECTOR GENERAL OF THE DEPARTMENT OF DEFENSE
ASSISTANTS TO THE SECRETARY OF DEFENSE
DIRECTOR, ADMINISTRATION AND MANAGEMENT
DIRECTOR, PROGRAM ANALYSIS AND EVALUATION
DIRECTOR, NET ASSESSMENT
DIRECTOR, FORCE TRANSFORMATION
DIRECTORS OF THE DEFENSE AGENCIES
DIRECTORS OF THE DOD FIELD ACTIVITIES

SUBJECT: DoD Executive Agent for Military Ground Based Counter Radio-Controlled
Improvised Explosive Device Electronic Warfare (CREW) Technology

I hereby designate the Secretary of the Navy as the DoD Executive Agent for CREW Technology. By this memorandum, I am issuing the attached interim guidance to facilitate the establishment of this critical arrangement.

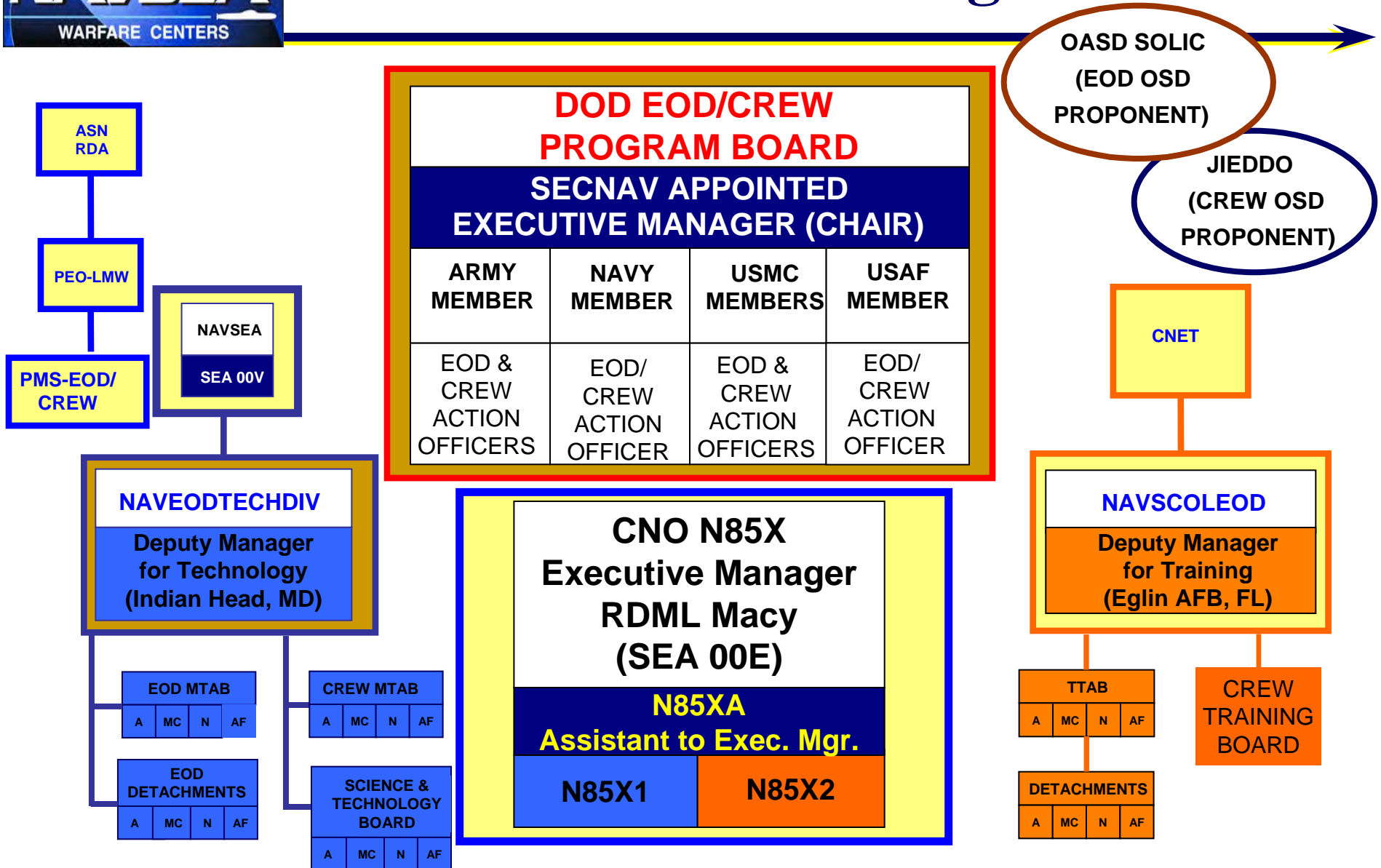
I direct the Director, Joint Improvised Explosive Device Defeat Organization, with the Director of Administration and Management, to coordinate the interim guidance across the Department and provide a final DoD Issuance for my approval by June 30, 2006.

Attachment:
As stated

cc: Director, Joint Improvised Explosive Device Defeat Organization



DOD EOD/CREW Organization





Contact Information

- Info package on how to prepare submissions to JIEDDO provided to NDIA EXW Conference staff.
 - For submissions & questions, eMail (<10 Mb) to:
IEDTaskForce@jieddo.dod.mil
 - Submissions and questions can also be mailed to:
Joint IED Defeat Organization
Technical Review Group
5000 Army Pentagon
Washington DC 20310-5000
- For CREW: Contact CAPT Mark Kavanaugh, PMS-408, 202-781-2066; mark.kavanaugh@navy.mil
- When all else fails: CDR Roger Hardy, 202-781-4064 roger.d.hardy@navy.mil



11th Expeditionary Warfare Conference

***Joint Expeditionary Operations in an
Uncertain World***

23-26 October 2006

**MajGen Thomas Benes
Director, Expeditionary Warfare Division
(N85)**





Naval Challenge

The challenge for the Navy and Marine Corps today is to remain capable of traditional naval missions while simultaneously enhancing our ability to conduct non-traditional missions in order to ensure that naval power and influence can be applied at and from the sea, across the littorals, and ashore, as required.

- Naval Operations Concept, 2006





Service Challenges

Strategic Landscape

- **The Long War**
- **Emboldened Adversaries**
- **Potential of Major Conflict**



Naval Expeditionary Capabilities Required

- **Guiding principles...Speed, Access, and Persistence**
- **Flexible, Scalable, Sustainable, Affordable**



Program Challenges

- **Resource limits**
- **Valid requirements underfunded**
- **Development Process...integrated but cumbersome**



Expeditionary Program Snapshot

Amphibious Force

- 2 Marine Expeditionary Brigade Assault Echelons**
- 2 Marine Expeditionary Brigade MPF(F) + MPS**
- LPD-17**
- LSD Modernization Plan**
- JMAC/LCAC-X**
- ERGM – reliability testing FY08**





MPF(F) Squadron

Amphibious Assault Ship (T-LHA)



- Lightship Displacement: 30,862 MT
- Landing Spots: 9/ship No well-deck
- Personnel: 3000/ship
- Ship Speed: 22kts

Multi-Purpose Amphibious Assault Ship (T- LHD)



- Lightship Displacement: 28,540 MT
- Landing Spots: 9/ship 3 LCAC
- Personnel: 3000/ship
- Ship Speed: 22kts

Large Medium-Speed Roll-On/Roll-Off (LMSR)



- Lightship Displacement: 36,289 MT
- Landing Spots: 2/ship
- Personnel: 345/ship (+500surge)
- Ship Speed 24 kts

Auxiliary Cargo and Ammunition Ship (T-AKE)



- Lightship Displacement: 25,700 MT
- Landing Spots: 1/ship
- Personnel: 194/ship
- Ship Speed 20 kts

Legacy MPS



- Lightship Displacement: 19,900 MT
- Landing Spots: 1/ship
- Personnel: 127 berths/ship
- Ship Speed 17 kts

Joint...

Potential universal interfaces for Navy and Army ships and small craft

Mobile Landing Platform (MLP)

- Light Ship Displacement: 28,423 MT
- Landing Spots: 1/ship 6 LCAC
- Personnel: 850 /ship
- Ship Speed 20kts



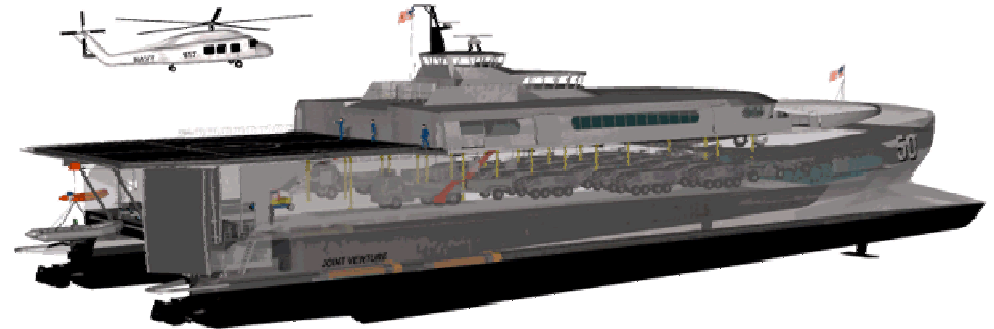
Supports rapid closure, assembly, employment, sustainment and reconstitution



Joint High Speed Vessel (JHSV)

Guiding Principles

- Joint program
 - One vessel design
 - One crewing strategy
 - One maintenance strategy
 - One supportability strategy
- Not a combatant
 - commercial non-developmental



Program Highlights

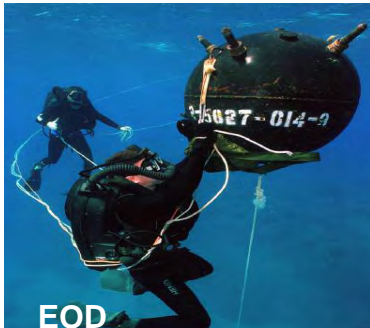
- Army-Navy program
- Capitalize on experiments
- Non-developmental approach
- Lead ship - FY08 (FY10 delivery) – ~20 year life
- Missions:
 - War on Terrorism
 - Theater Security Cooperation Program
 - Marine Expeditionary Brigade or Brigade Combat Team lift & Sustainment
 - Force Closure
 - Sea Basing Support

Key Characteristics

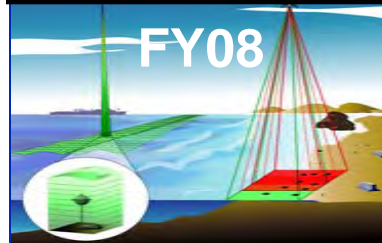
- | | | |
|---|------------------|---------------------|
| • High Speed | 35 – 45 kts | } “Iron Triangle” * |
| • Intra-theater (loaded range) | 1,200 nm | |
| • Medium-lift (payload) | 600 – 700 st | |
| • Self-deploying (unloaded range) | 4,700 – 5,200 nm | |
| • Net-ready (common C4I suite)* | | |
| • Aviation Capability* | * Cost drivers | |
| – Threshold: one H-60 flight deck spot, space for 1 hangar | | |
| – Objective: one CH-53K flight deck spot, space for 2 hangars | | |
| • Able to operate from austere ports | | |



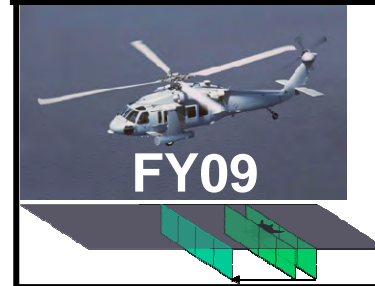
Mine Warfare – Legacy to Organic



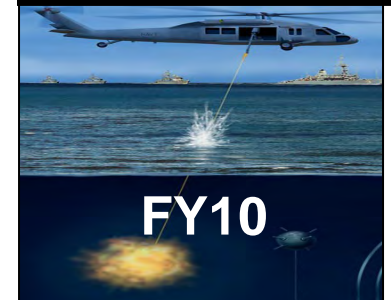
Coastal Battlefield
Reconnaissance &
Analysis System



Airborne Laser Mine
Detection System



Rapid Airborne Mine
Clearance System



Remote Mine Hunting
System & AN/AQS-20A



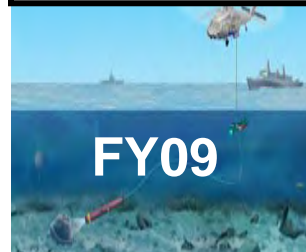
Transition
To Organic

LCS OMCM

LCS-1 Commissioned Sept 2006



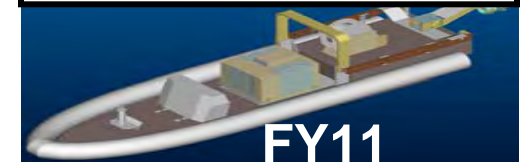
Airborne Mine
Neutralization
System



SCULPIN Unmanned
Underwater Vehicle



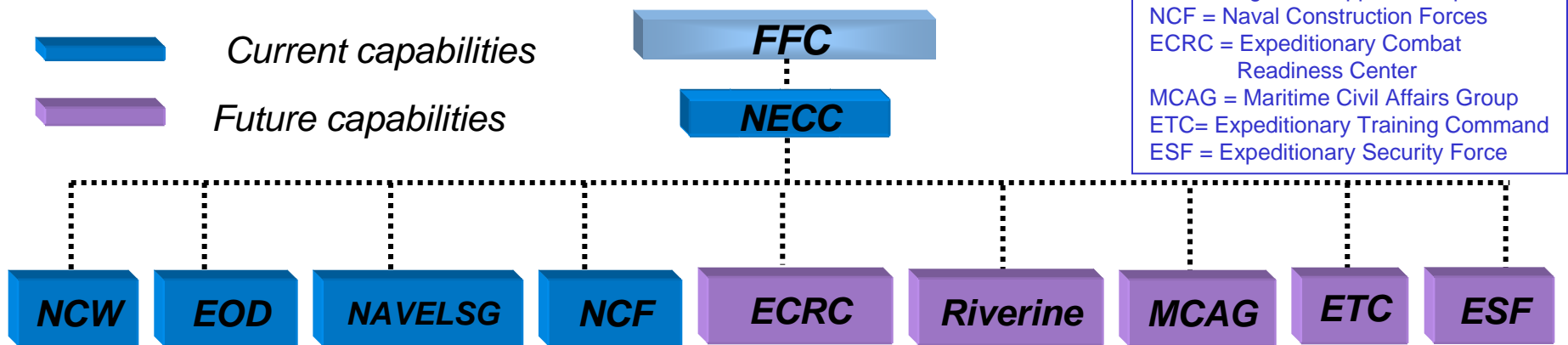
Unmanned Surface Vehicle &
Organic Airborne and
Surface Influence Sweep





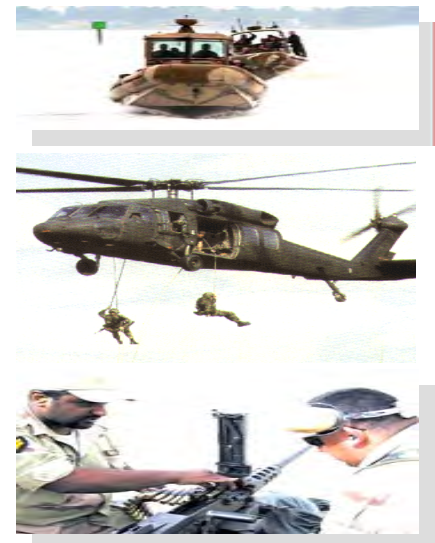
Navy Expeditionary Combat Command

CNO Guidance 2006: establish a more effective maritime protection strategy – green and brown water



New capabilities required

- Level III visit, board, search, and seizure (VBSS)
- Expanded maritime interdiction operation (MIO)
- Expeditionary training – to host nations by Expeditionary Training Command (ETC) & to sailors by Expeditionary Combat Readiness Command (ECRC)
- Maritime expeditionary security force (MESF)
- Civil affairs - Military Civil Affairs Group (MCAG)
- Riverine (3 Riverine Squadrons)





Way Ahead

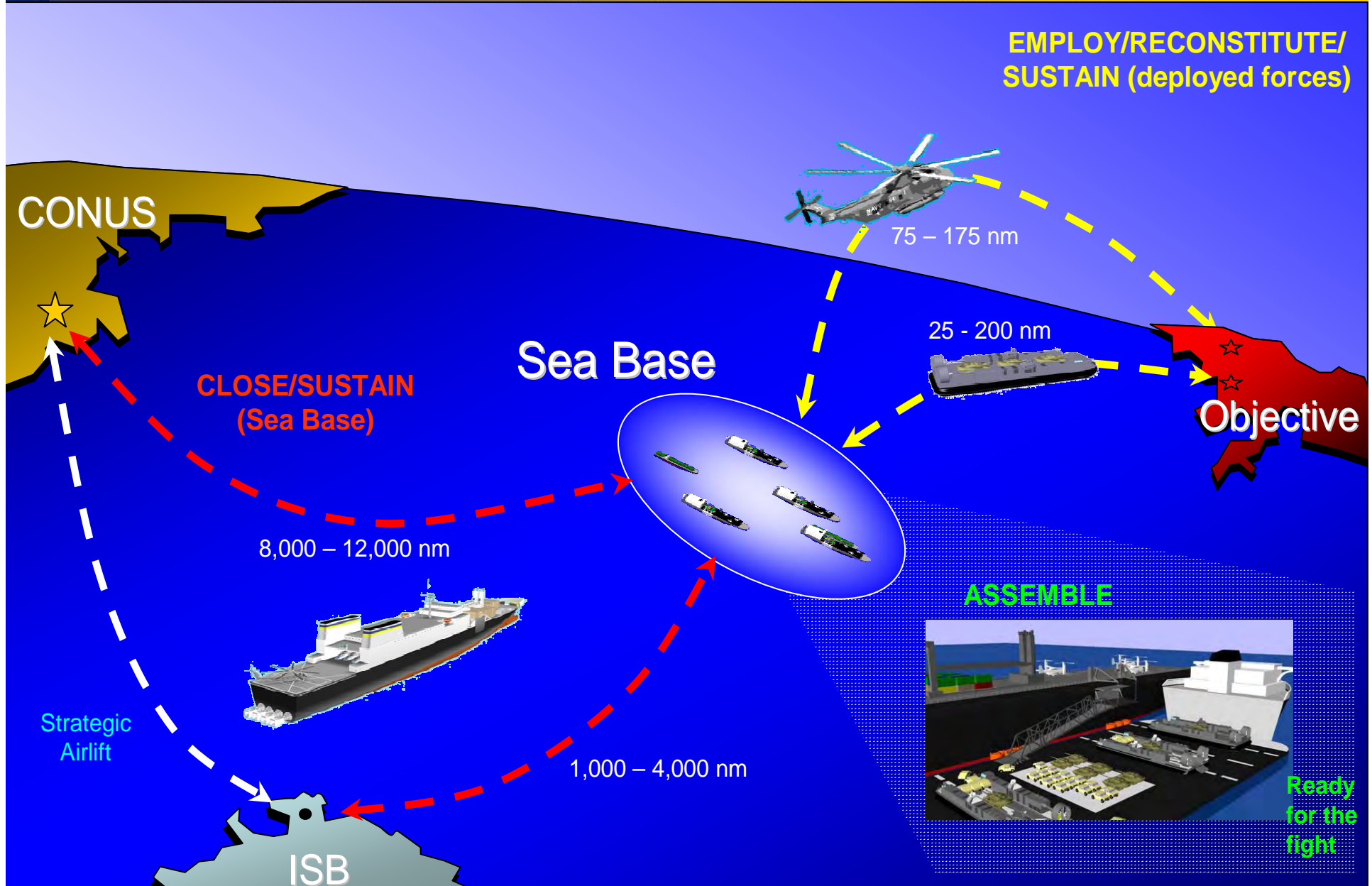
- **Partnership—OPNAV, Fleet Forces, ONR, Industry, Congress and American Public**
- **Complex Problems—require unique approaches-modularity, portfolio of systems, spiral development, risk**



Back Up Slides



Seabasing Future Naval Capabilities (FNC)



AEGBIS – Ballistic Missile Defense



- 2 Cruisers and 1 Destroyer are Capable of Firing SM-3 Interceptors and Conducting Long Range Surveillance and Tracking Operations (LRS&T)
- 10 Destroyers are Capable of Conducting LRS&T
- Gap-Filler Sea Based Terminal is in Progress
 - Aegis BMD modifying baseline computer program
 - PEO IWS modifying SM-2 Blk IV missiles
 - Demonstrated success with Linebacker

A Success Story

Aegis BMD - Delivered to Date

Engagement (BMD 3.6, BMD 3.0, SM-3 Blk I) and LRS&T



USS STETHEM (DDG 63)

BMD 3.6



USS SHILOH (CG 67)

BMD 3.6



USS LAKE ERIE (CG 70)

(BMD 3.6 Sep 06)

BMD 3.0



USS PORT ROYAL (CG 73)

(BMD 3.6 Dec 06)

BMD 3.0



USS CURTIS WILBUR
(DDG 54)



First SM-3 Blk I's - Nov 2004 -
11 Rounds Delivered as of Aug 06



First SM-3 Blk IA Encanned
2 Rounds Delivered as of 31 Aug 06

LRS&T (BMD 3.0E)



USS JOHN S. MCCAIN
(DDG 56)



USS FITZGERALD
(DDG 62)



USS RUSSELL (DDG 59)



USS MILIUS (DDG 69)



USS PAUL
HAMILTON (DDG 60)



USS JOHN PAUL JONES
(DDG 53)



USS BENFOLD (DDG 65)



USS HOPPER (DDG 70)



USS O'KANE (DDG 77)



USS HIGGINS (DDG 77)

Upgrade Installation in Progress

Littoral Combat Ship

Lockheed Martin Team

Lockheed Martin

Gibbs & Cox

Marinette Marine

Bollinger Shipyards



General Dynamics

Bath Iron Works

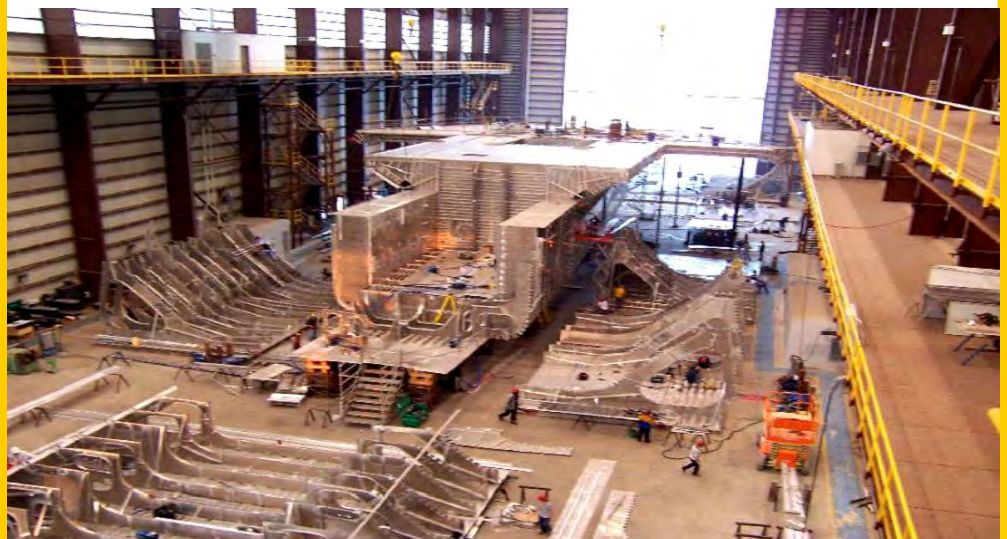
General Dynamics AIS

Austal USA

BAE Systems

MAPC

L3



LCS Mission Package Capability

Mine Warfare

Antisubmarine Warfare

Surface Warfare

VTUAV



USV



MH-60R



RMS



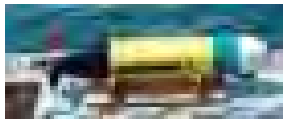
VTUAV



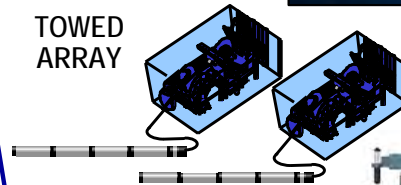
RMS



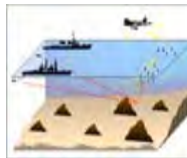
UUV



TOWED
ARRAY



USV

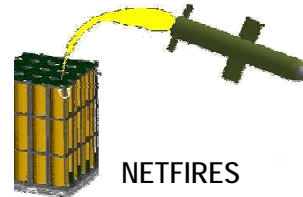


MULTISTATIC

MH-60R/S



VTUAV



NETFIRES



30mm Gun

Installed in Mission Module Spaces

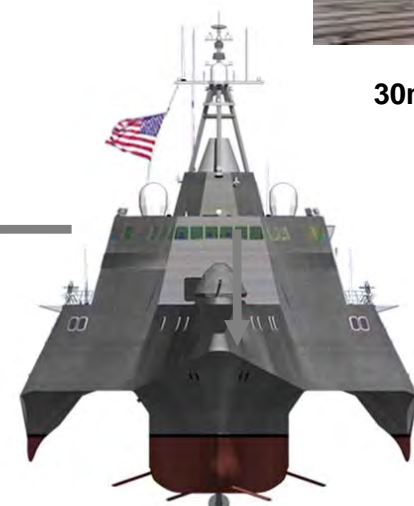
MH-60S



UUV



EOD



DDG 1000

Sensors

Dual Band Radar
Acoustic Sensor Suite
EO / IR System

Characteristics

Length	610 ft	Displacement	14,564 LT
Beam	81 ft	Installed Power	78 MW
Draft	28 ft	Crew Size	150
Speed	30 kts		

Integrated Power System

(2) 36 MW large gas turbine gensets
(2) 4 MW small gas turbine gensets
(2) 34 MW propulsion motors

Weapons

(80) cells
(2) VL AGS 155mm guns
(600) 155mm rounds
(2) 57mm guns

Superstructure

Composite structure

Hull

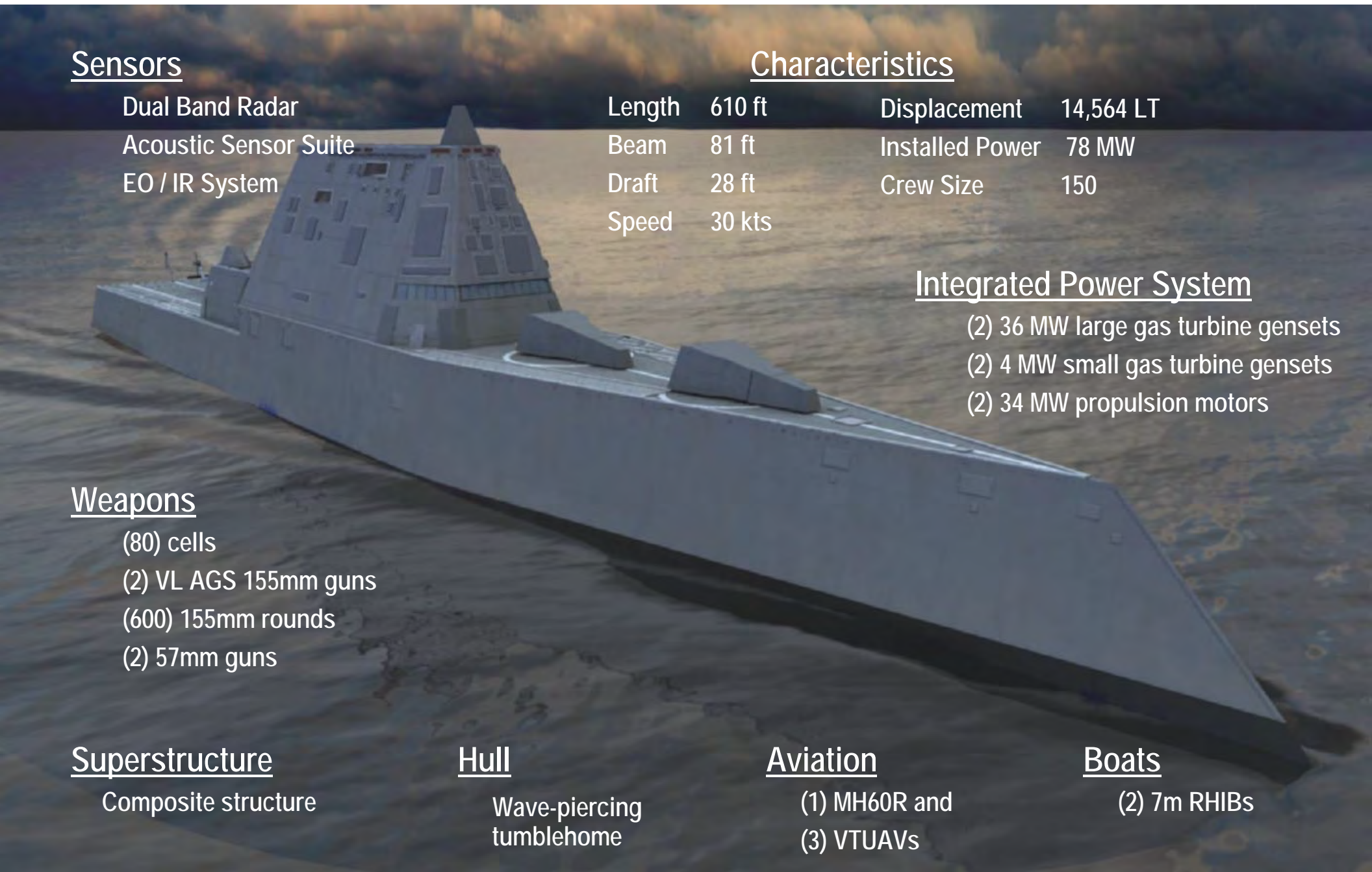
Wave-piercing
tumblehome

Aviation

(1) MH60R and
(3) VTUAVs

Boats

(2) 7m RHIBs



Cruiser Modernization

CG Baselines 2,3,4

BMC4I

CEC

SGS A/C (B/L 2)

CDLMS (B/L 2)

AIR DOMINANCE

AWS CR2 Computer Program

COTS computing plant

Radar and Display upgrades

VLS Modifications

FORCE PROTECTION

ESSM

CIWS BLK 1B

SPQ-9B (ASMD)

SARTIS

SQQ-89A(V)15 (B/L 3 & 4)

GUN WEAPON SYSTEM

(2) 5 inch/62 Guns

MK-160 Gun Computing System

OSS

HM&E

All Electric Mods

Smart Ship Upgrades

Structural Modifications

Quality of Service Upgrades

FY06 FY07 FY08 FY09 FY10 FY11 FY12 FY13 FY14 FY15 FY16

Full Mod

0 0 1 1 2 1 3 3 3 3 2

HM&E

1 2 1 0 0 0 0 0 0 0 0

C/S

0 0 0 1 0 2 0 0 0 0 0

B/L 2=CG52-58

B/L 3=CG59-64

B/L 4=CG65-73



Destroyer Modernization

Candidates

Warfighting Upgrades

C4I

NAVSSI BLK 4

IFF Modes 5

CEC

AIR DOMINANCE

CIC Display Upgrades

Open Architecture Computing Plant

VLS Mods (TACTOM/SM-2Blk4/ESSM/
Initial SM-6 Capability)

AWS CR-3 Computer Program

SPY-1D(V) COTS SIGPRO

SPY-1D Transmitter Upgrades

Multi-Mission BMD Capability

IABM

SM6/NIFC-CA

ESSM / STAMO Upgrades

FORCE PROTECTION

CIWS-1B

NULKA

SEWIP

SSTD (ATT)

MK 54 Torpedo/DFCI

SQQ-89A(V)15 w/MFTA

GUN WEAPON SYSTEM

MK-160 Mod X Gun Computing System

HM&E Modernization

Full IBS Upgrade

MCS/DCS Upgrades

GEDMS

Wireless Communications

Digital Video Surveillance

Quality of Life Upgrades

Advanced Galley

Mission Life Extension Upgrades

	<u>FY10</u>	<u>FY 11</u>	<u>FY12</u>	<u>FY13</u>	<u>FY14</u>	<u>FY15</u>	<u>FY16</u>
HM&E	2	3	3	3	3	3	3
CS			2	3	3	3	3

BACK UP

Cruiser & Destroyer Modernization

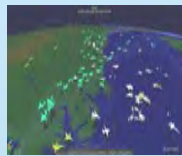
Mid-life modernization enables CG47 and DDG 51 class ships to achieve 35 year service life. Average life of unmodernized surface combatants < 20 years. Current 22 CG47s and 62 DDG 51s are required to achieve CNO's 2020 force structure

- The CG and DDG Mod Programs consists of upgrades to address changes in technology and likely threats since initial design that will ensure these ships are relevant through the 2020's.

- Upgrade to All Electric to improve QOL and save manpower and maint \$ (>\$4.7M per year – CG 47 only)
- Hull strengthening and stability mods to correct class issues
- Smart Ship type installations to save manpower through better use of technology
- Use of COTS to field 2nd and 3rd spirals of OA computing plant to support affordable and rapid future capability upgrades.
- Improvement to strike group interoperability and data sharing
- Improved capability against complex, high speed/maneuverable ASCMs
- Improved AAW capability against small fast targets in clutter environment
- Improved littoral SA and hard kill against low flying a/c and fast in-shore attack craft
- Improved USW and enhanced torpedo defense, especially in littorals

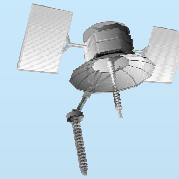
4 AEGIS ships can be modernized to achieve almost twice current average service life for less than the cost of 1 new AEGIS combatant

Cruiser Modernization



7PH 1C Computer Program,
Cooperative Engagement
Capability (CEC) &
Common Data Link Management
System (CDLMS)

Robust Joint
Command
& Control

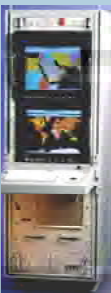


"Smart Ship"
COTS-based
Integrated
Control Systems



Navy Precision Fires:
5" / 62 Gun/MK 160 GCS

ASW:
SQQ 89A V(15)



VLS Mods:
Tactical Tomahawk



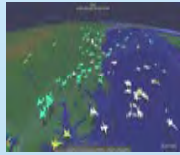
Force Protection:
CIWS BLK 1B, Evolved Sea
Sparrow Missile &
SPQ-9B

MH-60R



Transforming the Existing Fleet

DDG Proposed Upgrades



OA Computing Environment,
Cooperative Engagement
Capability (CEC)

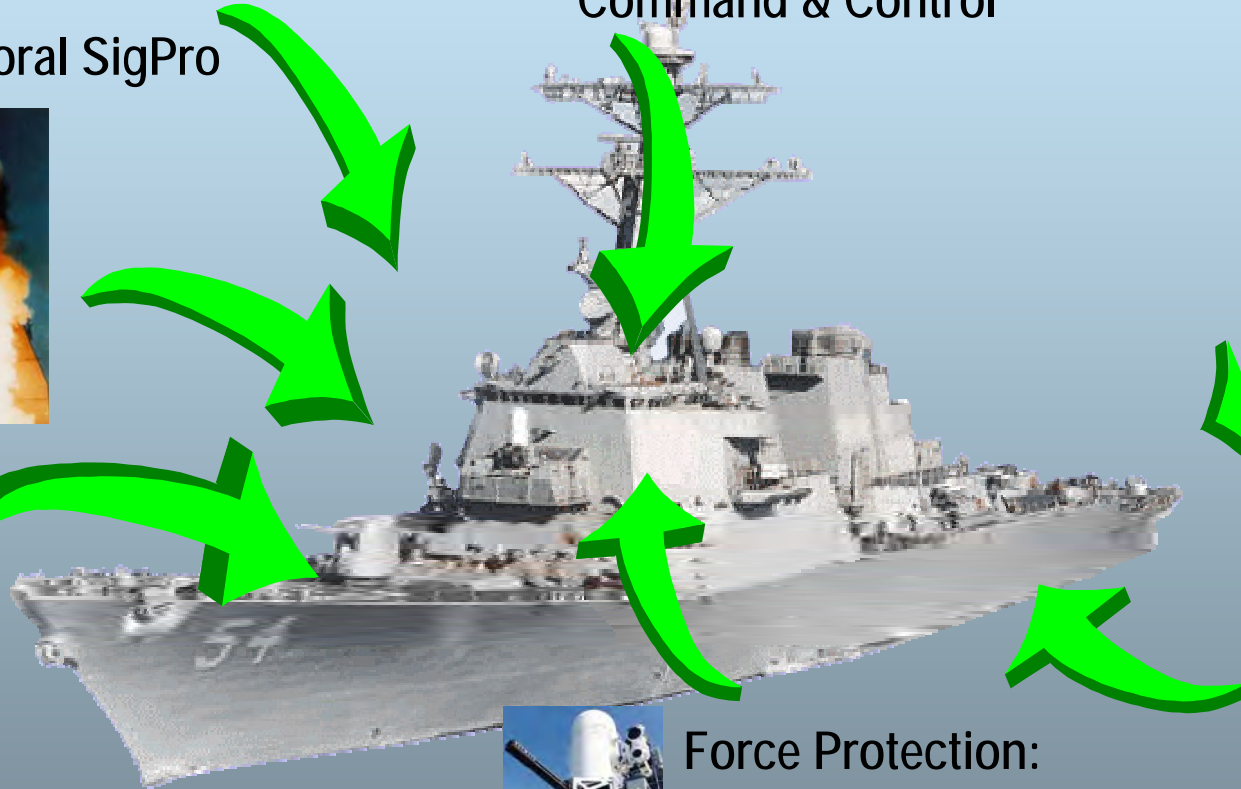


Robust Joint
Command & Control

TBMD & Littoral SigPro



Tactical
Tomahawk



ASW: SQQ 89A(V) 15



Force Protection:
CIWS BLK 1B, Evolved
Sea Sparrow Missile, SM-6



MH-60R

Building and Transforming the Existing Fleet

DDG Mod HM&E Upgrades

ADVANCED GALLEY



DIGITAL
VIDEO
SURVEILLANCE
SYSTEM



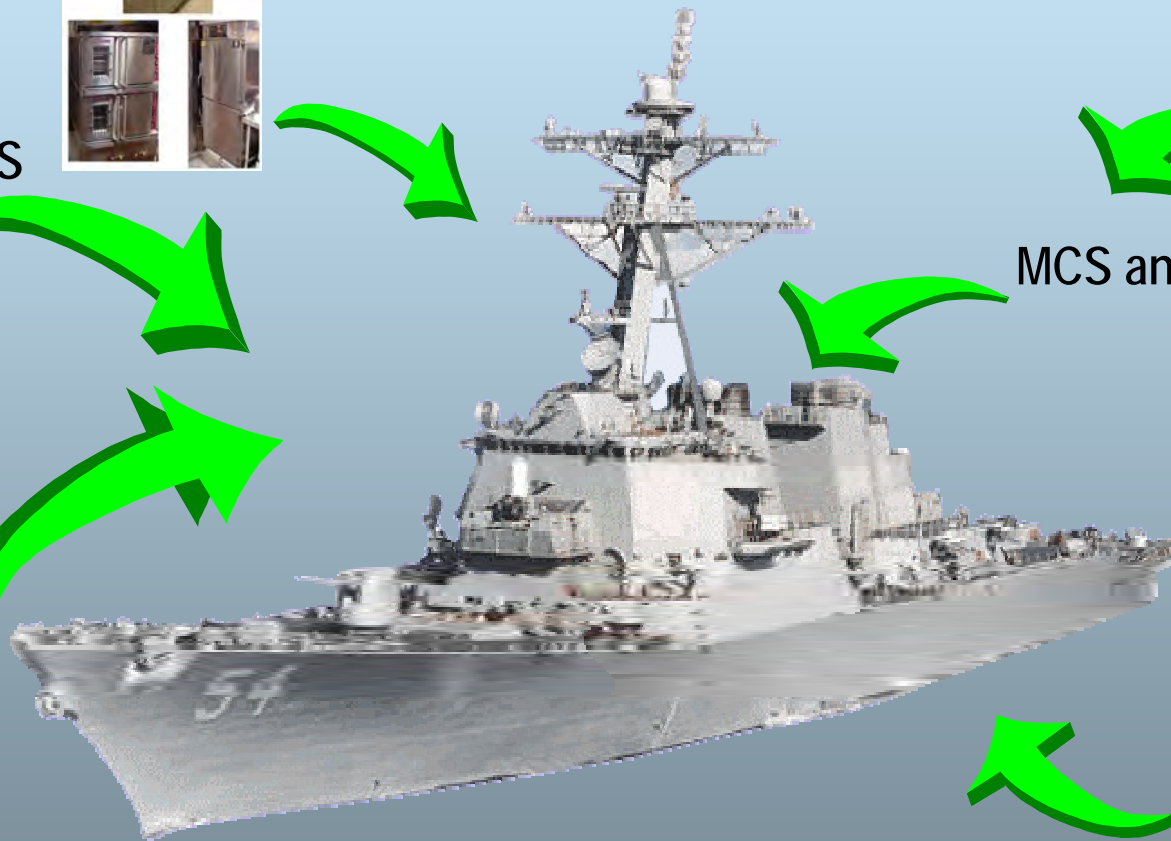
WIRELESS COMMS



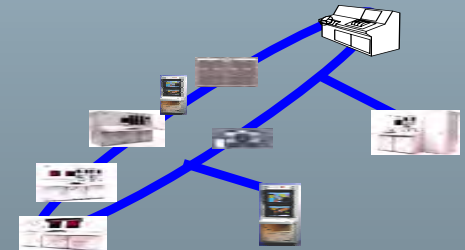
MCS and DAMAGE CONTROL
UPGRADES



INTEGRATED
BRIDGE



GIGABIT ETHERNET LAN



Achieving the Full Service Life



Edward McCallum

Combating Terrorism Technology Support Office



NDIA 11th Expeditionary Warfare Conference
23-26 October 2006



“Humanity was informed that it could make machines that would fly through the air. The conquest of the air and the perfection of the art of flying fulfilled the dream which for thousands of years had glittered in human imagination.”

Winston Churchill
March 1949, M.I.T.



System Challenges

- Rapid equipping vs. traditional acquisition
- Information Age vs. Industrial Age
- Operational analysis drives acquisition



Opaque Engagement





Operational Challenges



- Tactical/Law enforcement-style targeting
- Cyber-sanctuaries & internet criminality
- Tactical intelligence driven operations
- Building indigenous capability
- Strategic communications



“90% of this war will take place in the information domain.”

- Ayman al-Zawahiri



Policy Challenges

- Communications & commerce law
- Interagency & international best practices
- Strategic organizational model for the Long War



***“We are not yet organized,
interagency or internationally; to
execute this war.”***

**- GEN John Abizaid, CENTCOM
Commander, 2005**



“The old metrics no longer worked...”





Sea Control and Expeditionary Power Projection



*Tailored Force Packages
To Meet Our National Strategy*

Objective

Brigadier General Thomas L. Conant, USMC
Director, Capabilities Development Directorate
Marine Corps Combat Development Command
Quantico, Virginia



Our Mission



- “...THE SEIZURE AND DEFENSE OF ADVANCED NAVAL BASES AND FOR THE CONDUCT OF SUCH LAND OPERATIONS AS MAY BE ESSENTIAL TO THE PROSECUTION OF A NAVAL CAMPAIGN.
- ...DEVELOP, IN COORDINATION WITH THE ARMY, NAVY AND AIR FORCE, THE DOCTRINE, TACTICS, TECHNIQUES, AND EQUIPMENT EMPLOYED BY LANDING FORCES IN AMPHIBIOUS OPERATIONS.
- ...PERFORM SUCH OTHER DUTIES AS THE PRESIDENT MAY DIRECT.”

NATIONAL SECURITY ACT OF 1947 AS AMENDED
BY TITLE 10, U.S. CODE IN 1952



Our Tradition: Most Ready When the Nation is Least Ready



Why We're Unique



- **Maneuver Warfare Philosophy**
 - Nature of war: a violent struggle between hostile, independent, irreconcilable wills...
 - ...Chaos, friction, & uncertainty
 - Combine high-tempo ops with a bias for action
 - ...To achieve advantage – in any dimension.
- **Expeditionary Heritage**
 - Primarily a naval force, equally home at sea or ashore
 - Operating from very austere environments – worldwide
 - Across the full range of military operations
- **Concepts: Organize, Deploy, Employ**
 - Integrated concepts
 - The Marine Air-Ground Task Force (MAGTF)





The Naval Operating Concept (NOC)

A Mandate for Change



Steady State

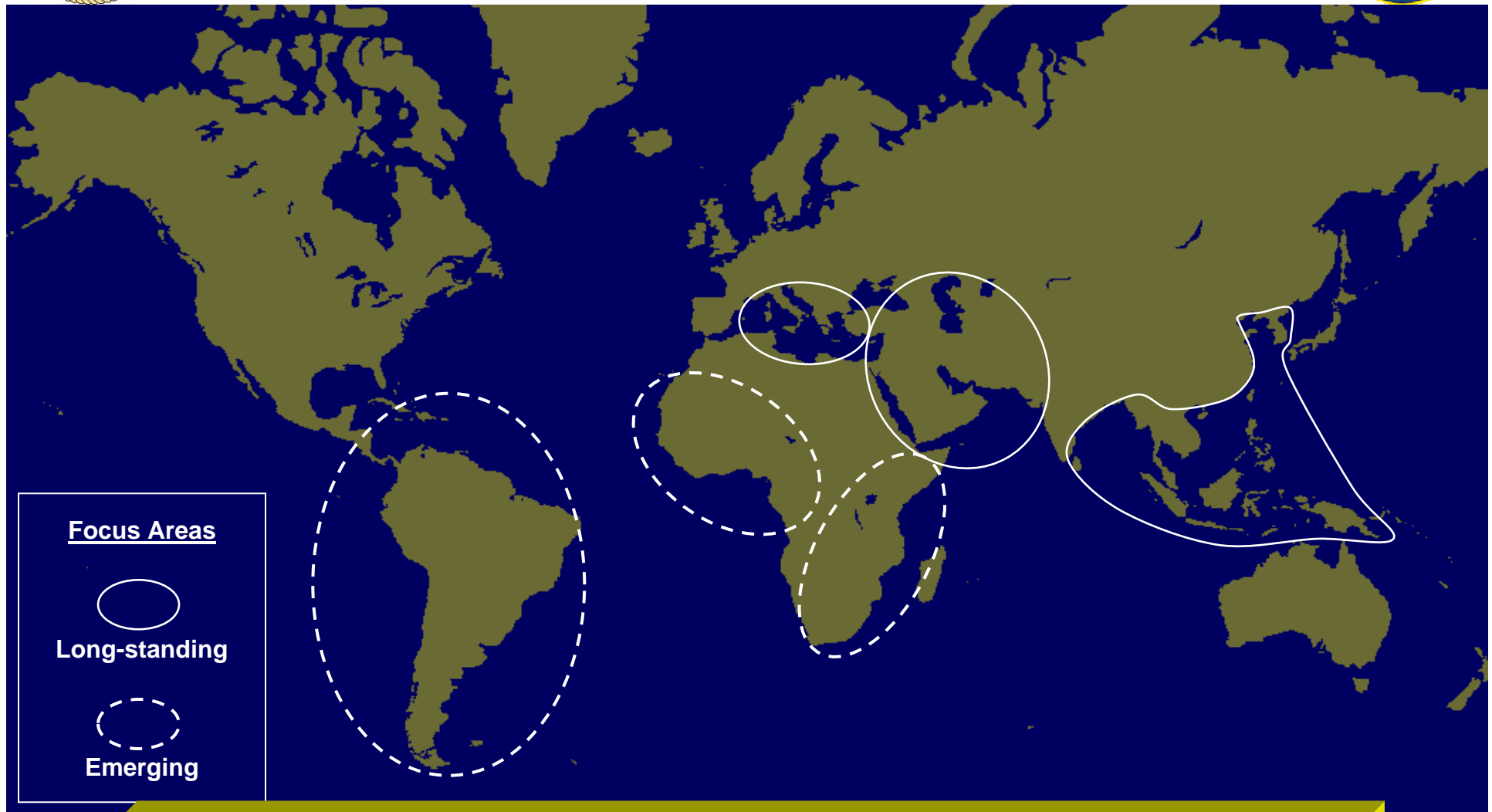
Surge





NOC Focus Areas

“A Shared Navy - Marine Corps Assessment”



The NOC provides the conceptual foundation for Naval capability development in support of CONPLAN 7500 and Homeland Defense.

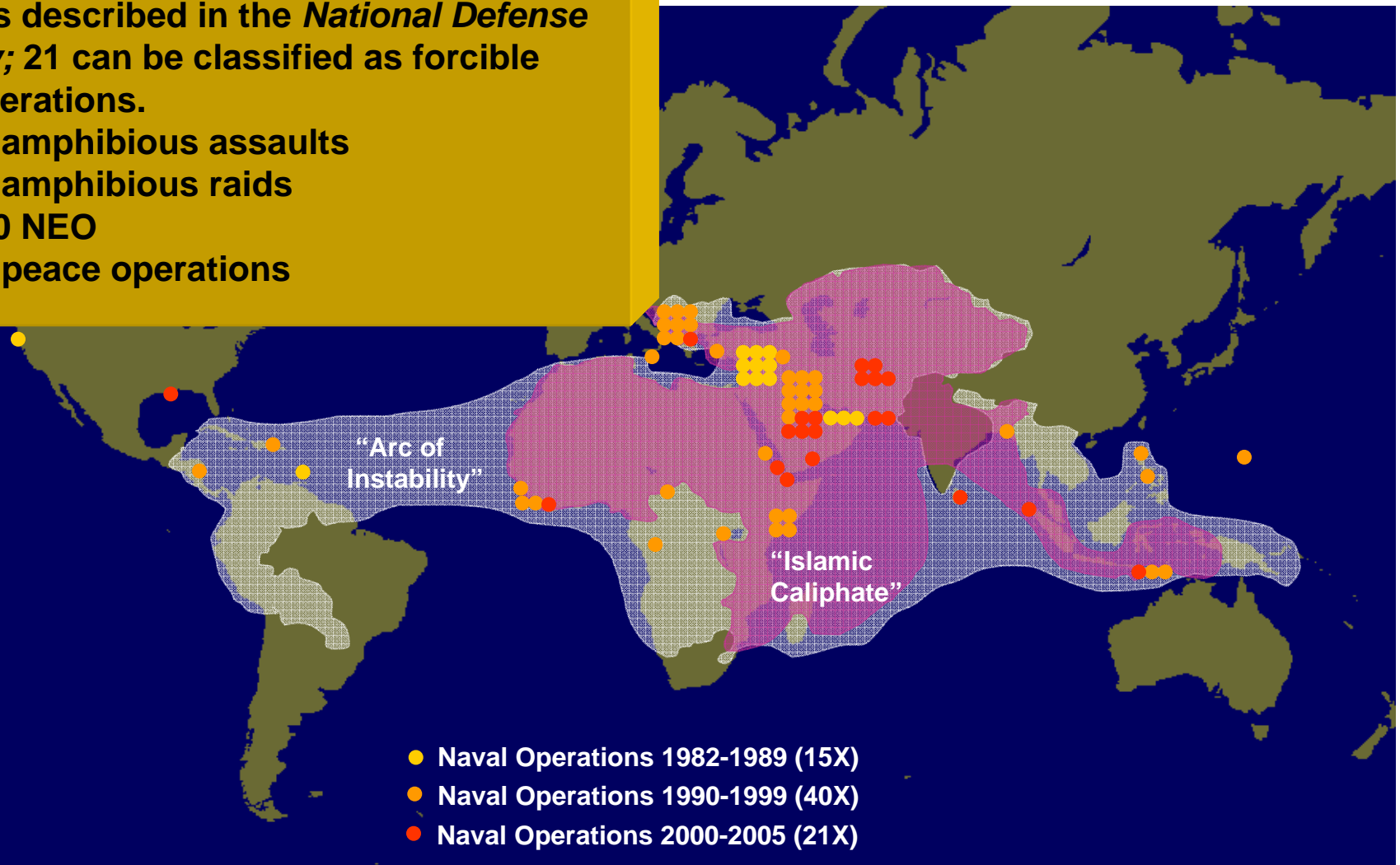


Recent Operations by U.S. Amphibious Forces



76 applications of amphibious capability in the past 23 years, covering the range of activities described in the *National Defense Strategy*; 21 can be classified as forcible entry operations.

- 6 amphibious assaults
- 3 amphibious raids
- 10 NEO
- 2 peace operations



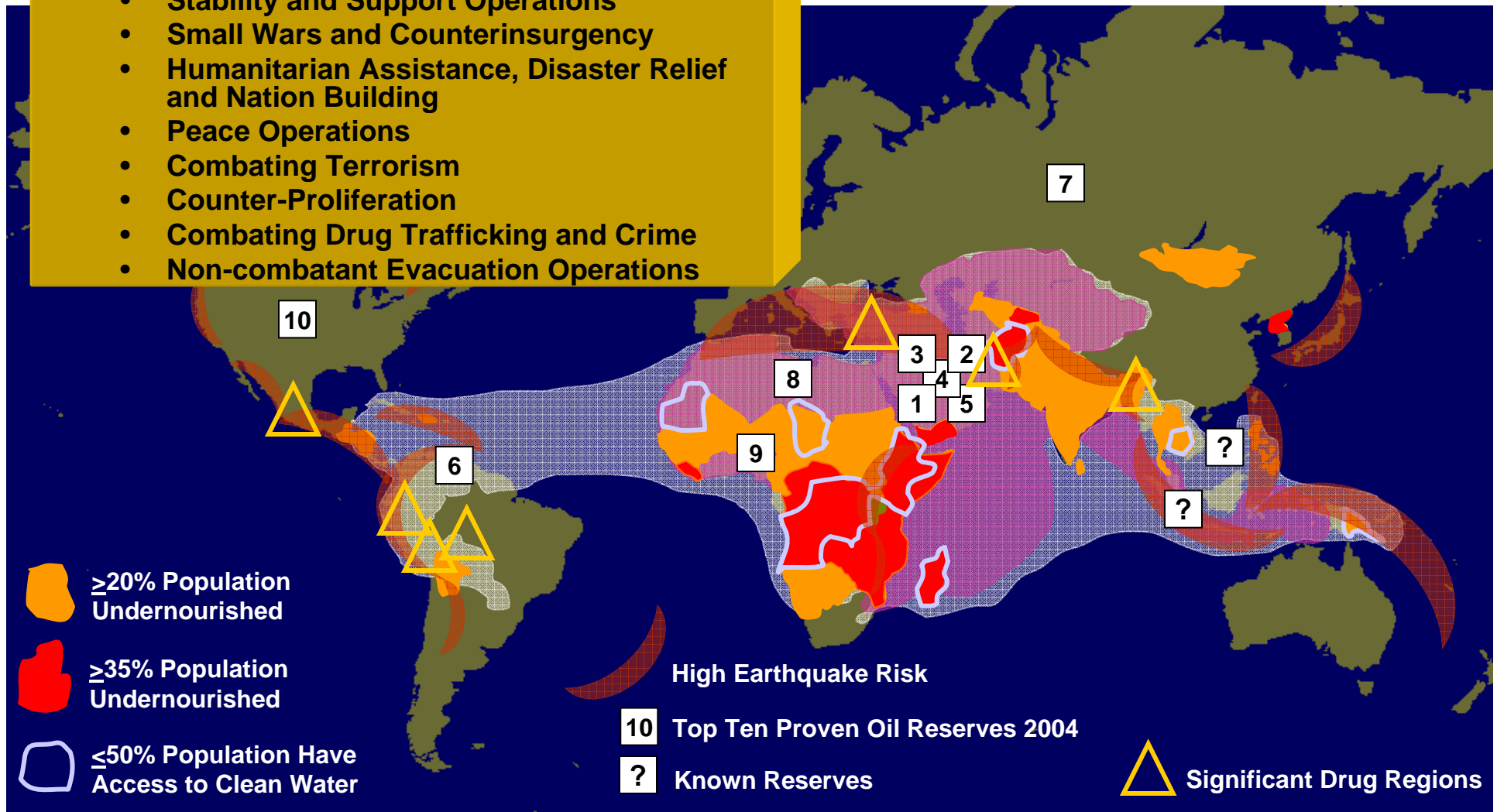


Likely Crises and Missions



Likely Operations (from the Marine Corps Midrange Treat Estimate 2005-2015)

- Stability and Support Operations
- Small Wars and Counterinsurgency
- Humanitarian Assistance, Disaster Relief and Nation Building
- Peace Operations
- Combating Terrorism
- Counter-Proliferation
- Combating Drug Trafficking and Crime
- Non-combatant Evacuation Operations





Enhancing Phase 0-2 & 4-5 Capabilities

Via Expanded Naval Missions



Global Fleet Stations
Distributed
Globally Networked
Adaptive force packaging
Aggregate, disaggregate & re-aggregate
Culturally aware
Task focused
Build partner capacity
Cross Fleet Standardization

Naval Forces sized, shaped, and globally postured for:

- Forward Naval Presence
- Security Cooperation
- Counterinsurgency (COIN)
- Counterterrorism
- Civil-Military Operations
- Counter-proliferation
- Maritime Security Operations
- Crisis Response
- Deterrence
- Sea Control
- Air and Missile Defense
- Expeditionary Power Projection
- Information Operations



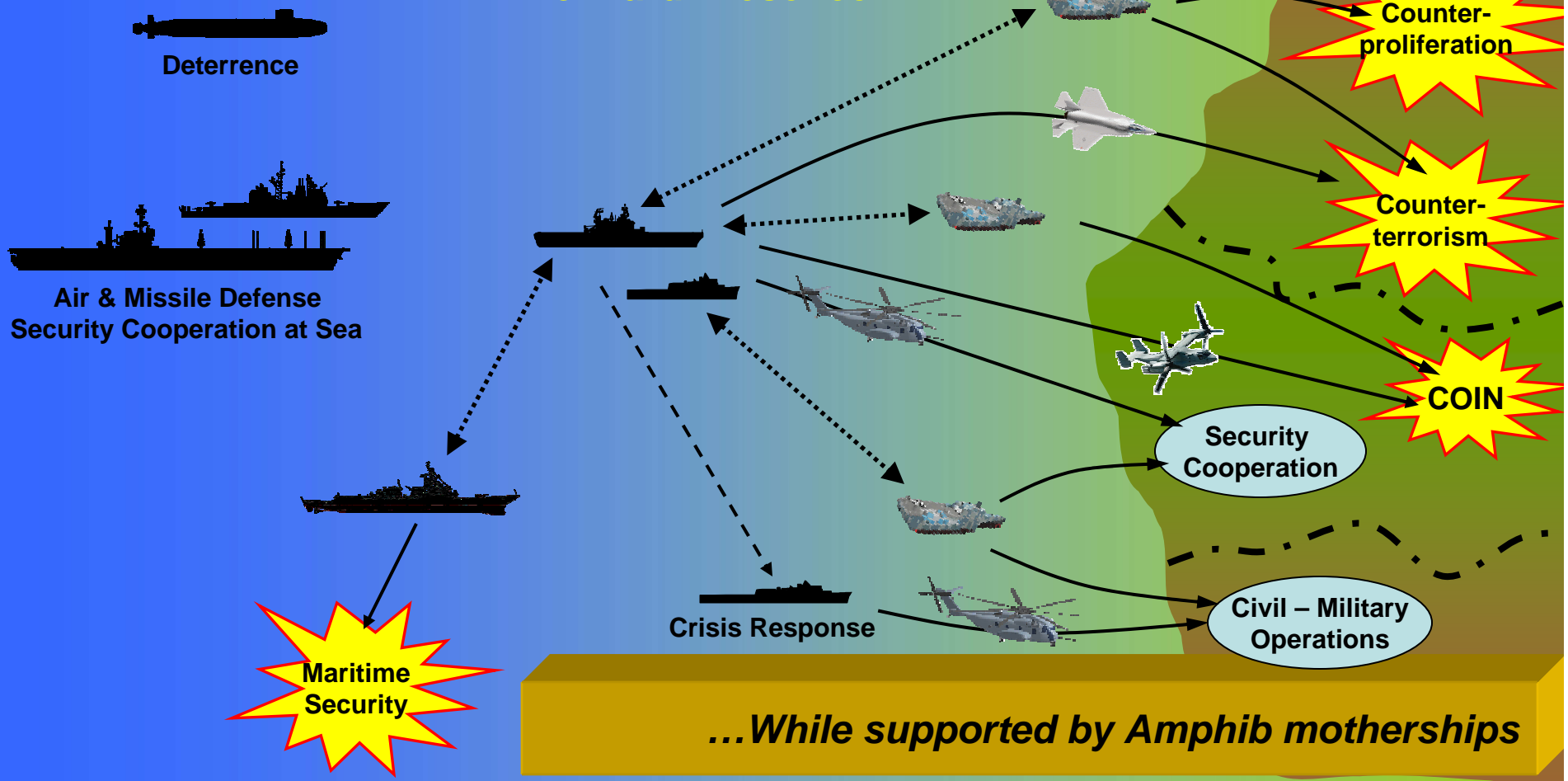
Enhancing Phase 0-2 & 4-5 Capabilities

Via Distributed Operations Capable SPMAGTFs



Employed from platforms like Littoral Combat Ship, riverine craft, destroyers...

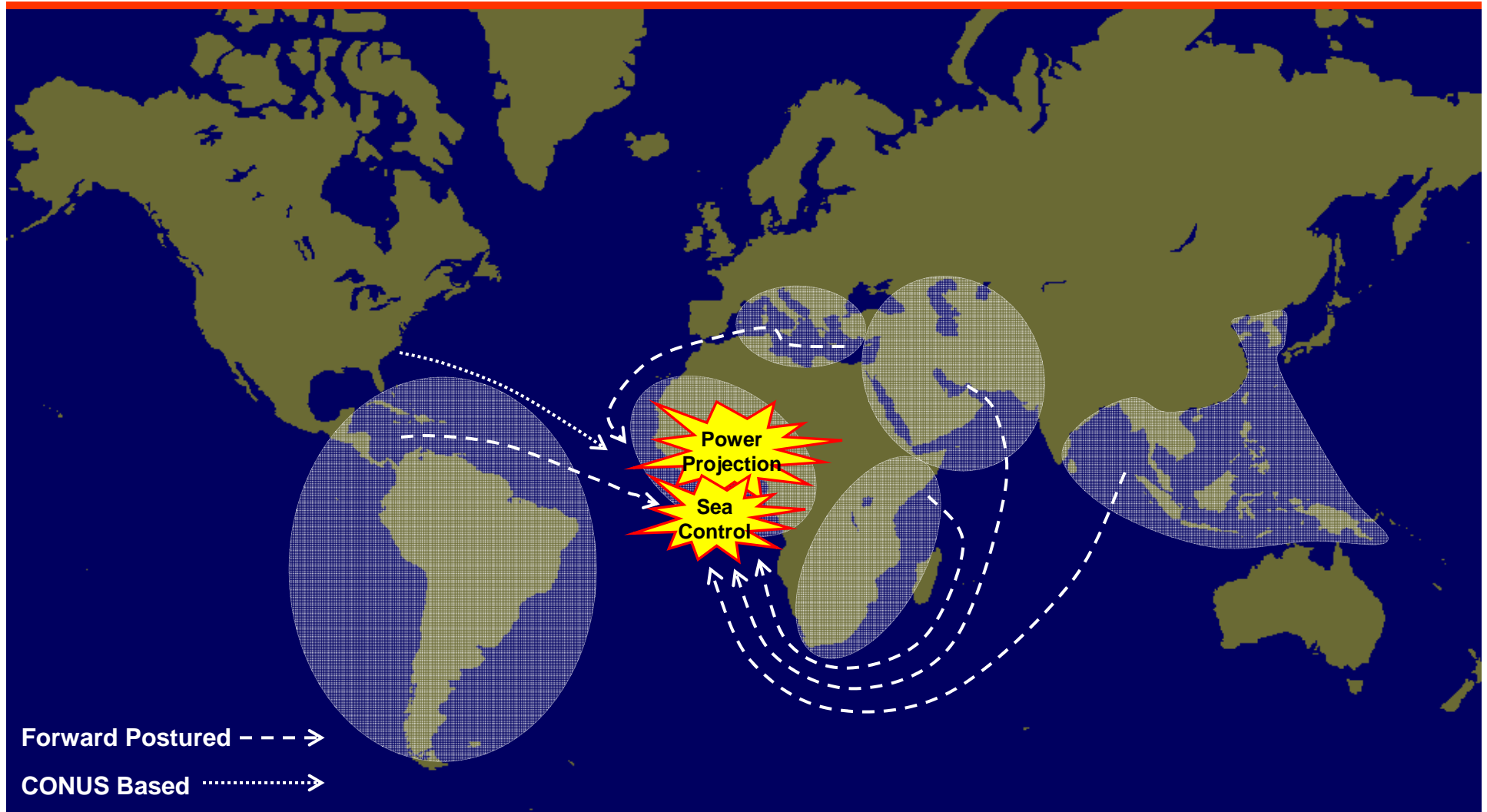
Forward Presence





Enhancing Phase 2-3 Capabilities

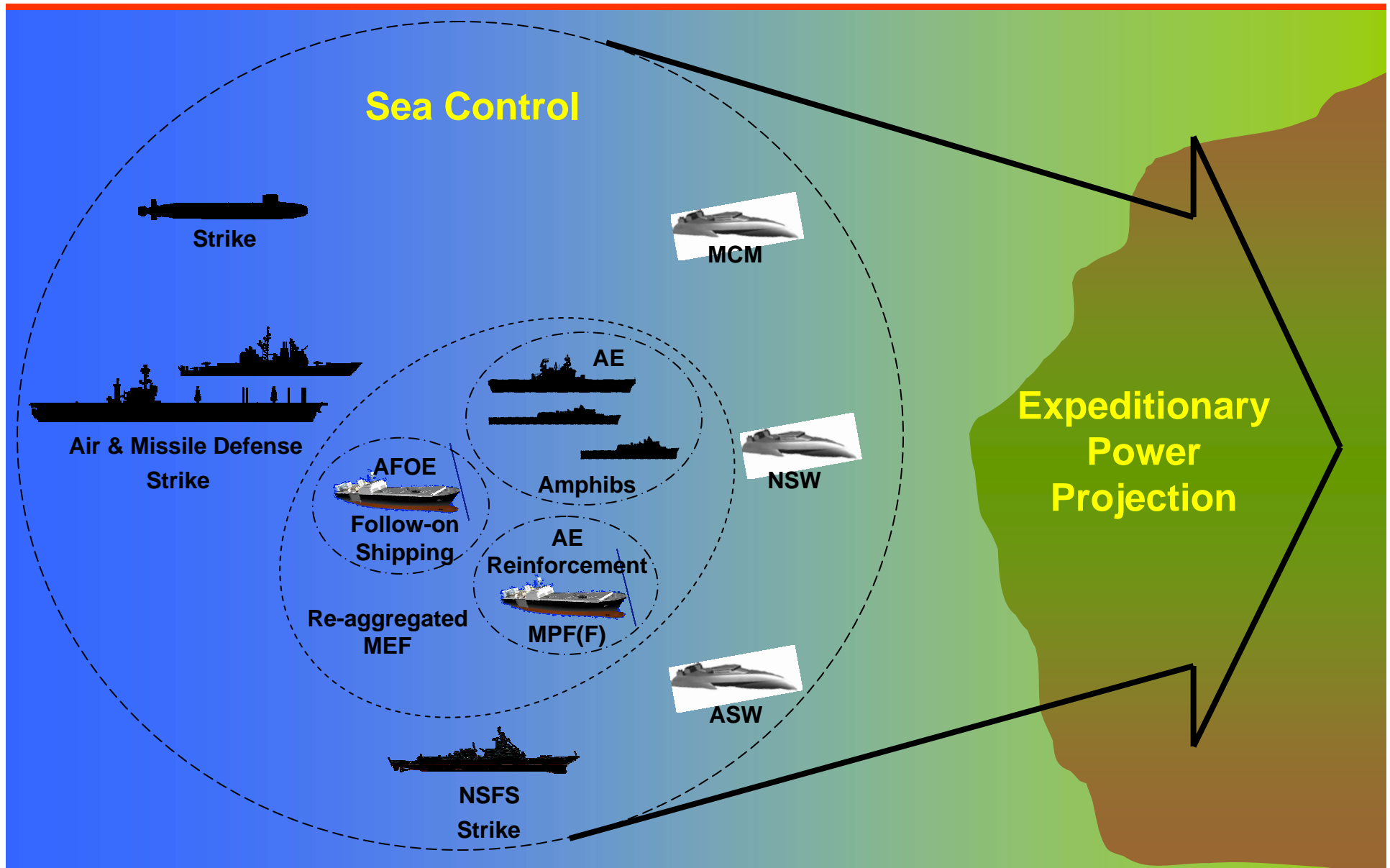
By Re-aggregating Naval Forces





Enhancing Phase 2-3 Capabilities

Joint Forcible Entry by Re-aggregated Naval Forces

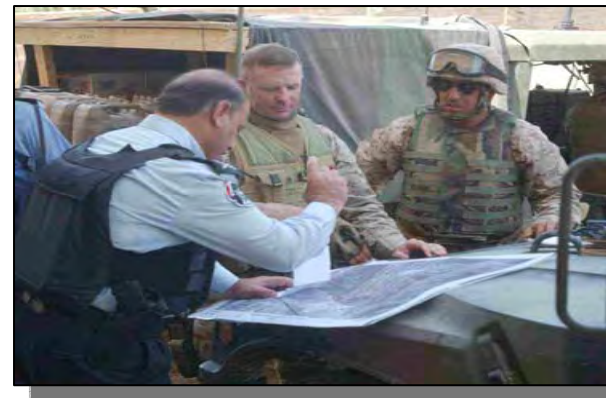




Summary



- **Executing U.S. strategy is dependent on continuous regional shaping, stability operations, and overcoming challenges to access.**
- **Naval forces are crucial for Phases 0, 1, 2 & 3 (Shape, Deter, Seize Initiative, & Dominate)**
- **Amphibious ships remain the critical centerpiece of seabased persistence and the hub of force projection & influence ashore**
- **Innovative force packaging and the ability to tailor forces on the fly**





Sea Control and Expeditionary Power Projection



Brigadier General Thomas L. Conant, USMC
Director, Capabilities Development Directorate
Marine Corps Combat Development Command
Quantico, Virginia



The NOC at a Glance

Naval Operations Concept Construct

Commander's Guidance: Leverage Historic Interdependence, Assess/Consult, Open Discussion/Debate With a Common Goal

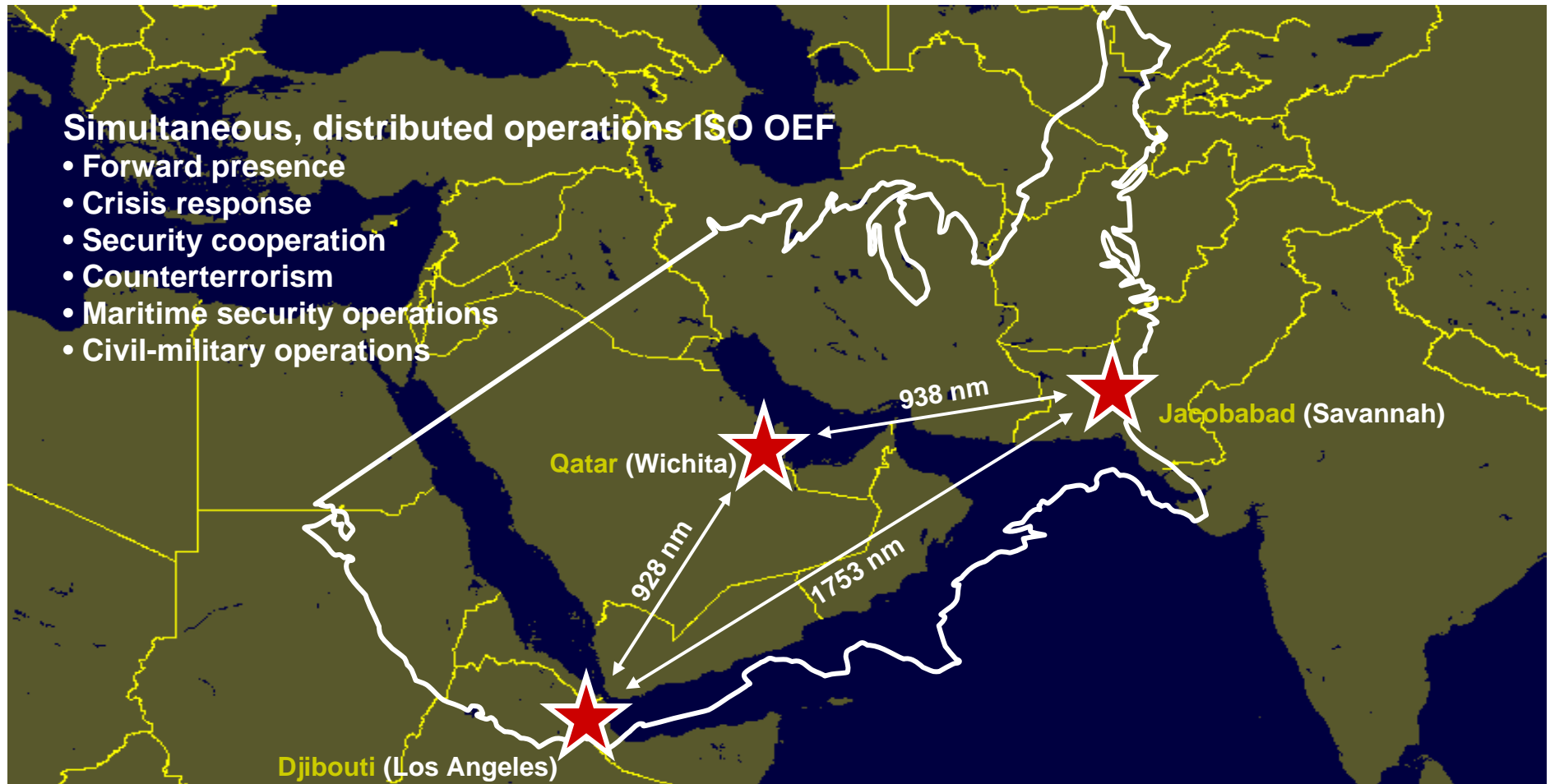
Strategic Missions	Naval Missions	Guiding Naval Principles	Methods	Strategic Objectives/Outcomes
Homeland Defense (HLD)	Forward Naval Presence	Agility	Globally Networked Operations	Help Win the Nation's Wars
War on Terror (WOT)/ Irregular Warfare (IW)	Crisis Response	Coordinated Global Influence	Distributed Operations	Establish Favorable Security Conditions
Conventional Campaigns	Expeditionary Power Projection	Deployability and Employability	Adaptive Force Packaging: Right Force, Right Time, Right Place	Secure Strategic Access & Retain Global Freedom of Action
Deterrence	Maritime Security Operations	Interoperability	Aggregate, Disaggregate, Re-aggregate	Strengthen Alliances and Partnerships
Shaping and Stability Operations (SSO)	Sea Control	Persistent Presence	Cross Fleet Standardization	Secure US from Attack
	Deterrence	Adaptive Force Packaging	Task Focused Training	
	Security Cooperation	Precision	Cultural Awareness	
	Civil-Military Operations	Speed	Sea Basing	
	Counterinsurgency	Unpredictability for Our Adversaries and Reliability for Our Friends	Building Partner Capacity	
	Counterterrorism			
	Counter-proliferation			
	Air and Missile Defense			
	Information Operations			

Foundations of NOC: Leadership and Professionalism, Mission Type Orders, Global Awareness (Maritime Domain Awareness and Beyond), and Interdependence



15th MEU (SOC)/PELELIU ARG

Nov 2001





Aggregated Naval Forces in OEF





National Defense Strategy



- **Given US preeminence in *traditional* forms of warfare, our potential adversaries are driven toward *irregular, catastrophic* and *disruptive* methods.**
- **Describes the current and future strategic environment as an uncertain one, with a variety of potential challenges posed by:**
 - Rising potential peer competitors
 - Failing or failed states that undermine regional stability and threaten our interests
 - Non-state actors who seek to undermine legitimate governments.
 - Terrorists
 - Insurgents
 - Criminals
 - Pirates
- **Countering these challenges calls for more widely dispersed forces that can:**
 - Provide increased forward presence
 - Conduct security cooperation with an expanding set of international partners
 - Act swiftly to preempt non-traditional threats
 - Globally respond to crises in spite of challenges to access.



Hierarchy of Marine Corps Concepts



The National Defense Strategy

Outline approach to dealing with 21st Century challenges.

The 21st Century Marine Corps

Broad guidance and direction for the future of the Marine Corps.

*Marine Corps Midrange Threat Estimate
2005-2015*

Description of the environment, threats, and types of operations Marine Corps forces will likely encounter.

*Operational Maneuver From the Sea
Ship-to-objective Maneuver*

Conceptual foundation for littoral power projection.

Draft Naval Operations Concept (NOC)

**Marine Corps Operating Concepts
for a Changing Security Environment**

**Descriptions of
how, when and
where Naval forces will
contribute to the
National Defense Strategy.**

Concepts of Operation (CONOPS)

Operating concepts applied against likely scenarios in order to inform capability development and investment decisions.

Seabasing; Distributed Operations;
Command and Control/FORCEnet; Intelligence;
Fires & Maneuver; Logistics; Force Protection

Enabling and functional concepts
that drive
DOTMLPF changes.



NOC Implementation



- **“This concept articulates the U. S. Naval contribution to the national defense...”**
 - Congress and the American people to gain public support
 - Joint, Interagency & Multinational players to solidify partnerships
 - Sailors & Marines to foster innovation
- **“It delineates how, when, and where the Navy and Marine Corps will support the Combatant Commanders’ efforts to counter traditional, irregular, catastrophic and disruptive challenges.”**
 - Unified Command Plan has a regional focus while we are fighting a global war...how does the Naval team meet Combatant Commanders’ needs in a manner that achieves coordinated global influence?
 - Where, when, and how can Naval forces be most effective?
 - What adaptive force packages might be most appropriate for each focus area?
 - What are the key venues for developing an integrated, global approach?
- **“It is also intended to foster innovation and initiative, while maintaining unity of effort, as we refine our forces to best serve our nation...”**
 - How do we make this a truly collaborative Naval effort? Key interdependencies?
 - Fostering a Naval intellectual renaissance? Revisions to training, education, and professional development? Seminars, wargaming, experimentation, professional debate?
 - Closer alignment of command and staff organization and processes?
 - Coordinated Naval input to the Joint Capabilities Integration and Development System?



Extant Concepts



- ***Operational Maneuver from the Sea (OMFTS)***
 - Still relevant given the challenges to access noted national strategy documents
 - Provides our conceptual foundation for littoral power projection against both traditional and non-traditional challenges.
- ***Ship to Objective Maneuver (STOM)***
 - Still applies but will require a re-balancing of capabilities to address a wider range of missions, such as raids against terrorist base camps and infrastructure, securing WMD, and providing humanitarian assistance/disaster relief.
- ***Seabasing***
 - The key enabling concept for OMFTS/STOM
 - Provides the means of maneuver, support and sustainment
 - Reduces our footprint and associated vulnerabilities ashore
- ***Distributed Operations (DO)***
 - The key enabling concept for preparing Marines to deal with diverse challenges
 - Promotes training, education and equipment innovations



Forward Presence, Security Cooperation & Counterterrorism



- **Problem:** The strategic environment, objectives and approach described in the national strategy call for increased forward presence, security cooperation with an expanded set of partners, and enhancing our ability to counter terrorism.
- **Central Idea: Determine requisite Navy and Marine Corps capability and capacity enhancements:**
 - Security Cooperation
 - Foreign Internal Defense
 - Civil-Military Operations
 - Maritime Interdiction/Visit, Board, Search and Seizure
 - Raids/Strikes vs. sanctuaries, base camps, transit routes, leadership, C2, mobility assets, etc.
 - Safeguard/Recover WMD
 - Safeguard/Recover personnel and property
- **Implications:**
 - Explore additional sizing options for the MAGTF, other Marine Corps forces, and associated ship mix to meet the expanded requirement.
 - Evolve the Naval element of the global defense posture.
 - Impact of forward presence requirements on balancing the fleet.



Crisis Response



- **Problem:** The optimal force structure, associated lift, and global posture that balances the requirements for security cooperation and counterterrorism with the competing requirement to effectively respond to crises across the spectrum of conflict has not been determined.
- **Central Idea:**
 - Comprehensively re-examine what resources should be:
 - Forward deployed
 - Pre-positioned
 - Retained at home stations
 - Include an assessment of:
 - Available lift
 - Time required to deploy, employ and sustain forces
- **Implication:**
 - Assessment of Theater Security Cooperation plans and the relation to crisis response, global lay-down, and campaign design



Forcible Entry



- **Problem:** Forcible entry will likely be initiated on a compressed timeline, by forces concentrating from dispersed locations across significant distances, and with varying degrees of access within the operating area.
- **Central Idea:**
 - Each forcible entry operation will be unique based on the mission, the adversary, the operating environment and time considerations.
 - Will be executed by a combination of forward-based, forward deployed, pre-positioned and CONUS based forces
 - Will be conducted through phased, overlapping and interdependent actions:
 - Gaining and maintaining access – controlling air, sea, land & cyberspace
 - Opening entry points – assaulting designated objectives
 - Transitioning to follow-on operations – facilitating the rapid buildup of combat power
 - Critical aspects are speed, unpredictability, and assessment of enemy capabilities and actions.
- **Implications:**
 - Forcible entry must be understood as scaleable, not just “high end.”
 - Impact on lift, basing, and deployments
 - Joint interdependencies
 - Joint Forcible Entry CONOPs: Chartered through JROC



Prolonged Operations



- **Problem:**

- The Marine Corps is organized, trained and equipped as an expeditionary – general purpose force (most ready, when the Nation is least ready).
- The characteristics that make the Marine Corps a rapidly deployable, expeditionary assault force for high intensity, short duration operations create certain challenges when assigned tasks of sufficient scope, scale, or duration to demand significant change in normal personnel policies, training, or equipment.

- **Central Idea:**

- USMC provides 30% of the nation's ground combat power and 25% of its tactical airpower, so our commitment to prolonged operations is unavoidable.
- Marine Corps forces have historically been heavily committed to prolonged operations.
- Characteristics of prolonged operations:
 - Stress on personnel tempo and increased reliance on Reserves
 - Interruption or modification of normal individual or unit rotation cycles
 - Shortened training cycles to meet operational requirements
 - Lowered materiel readiness
 - Modifications to organizations and equipment focused on a specific mission

- **Implications:**

- Adjustments to organization, training and equipment for prolonged operations must balance short and long-term requirements.
 - Ex: EFV versus vehicles more suited for counterinsurgency



Countering Irregular Threats: A New Approach to Counterinsurgency



- **Problem:** We struggle with conceptualizing the threat and designing campaigns for countering irregular threats and subsequently focus on combat operations. In successful conflict resolution against irregular threats a comprehensive campaign along with the capabilities and capacities that contribute to the defeat of irregular threats is necessary.
- **Central Idea:**
 - The military should reconsider the role it will play in the pursuit of political objectives beyond combat operations and the use of coercive force.
 - Should view both the problem and the solution more holistically and completely.
 - The Marine Corps should expand its lines of operation to include the following:
 - Information
 - Combat Operations
 - Establish Essential Services
 - Train and Advise Host Nation Military and Security Forces
 - Economic Development
 - Promote Governance
- **Implications:** Provides the conceptual foundation for multiple development efforts.



Irregular Warfare Connecting Files



Tentative Manual for Countering Irregular Threats

- ***USMC concept for battalion & above***
- ***Foundation for partnerships & efforts in IW***

- ***Counterinsurgency doctrine***
 - Army-Marine Corps effort with Aug 2006 publication
 - Targeted at the battalion level and above
- ***Small Unit Leader's Guide for Counterinsurgency***
 - Targeted at the company level and below
 - Initial publication underway w/immediate fielding to deploying battalions and MARSOC
- ***Irregular Warfare concept***
 - SOCOM-Marine Corps concept to apply and counter irregular warfare: Version 1.8
 - Supports CONPLAN 7500
- ***Joint Operating Concept for Irregular Warfare***
 - USSOCOM / USMC led
 - Anticipate release in Dec 2006
- ***Other efforts;***
 - EXPEDITIONARY WARRIOR 06
 - Distributed Operations Experimentation & Implementation
 - DoD 3000.05 Security, Stability, Transition & Reconstruction
 - USMC – UK: *Countering Irregular Activity Concept*
 - Interagency Seminars: Responding to States in Crisis: New Approaches to Humanitarian and Conflict Intervention Table-top Exercise

Force Structure

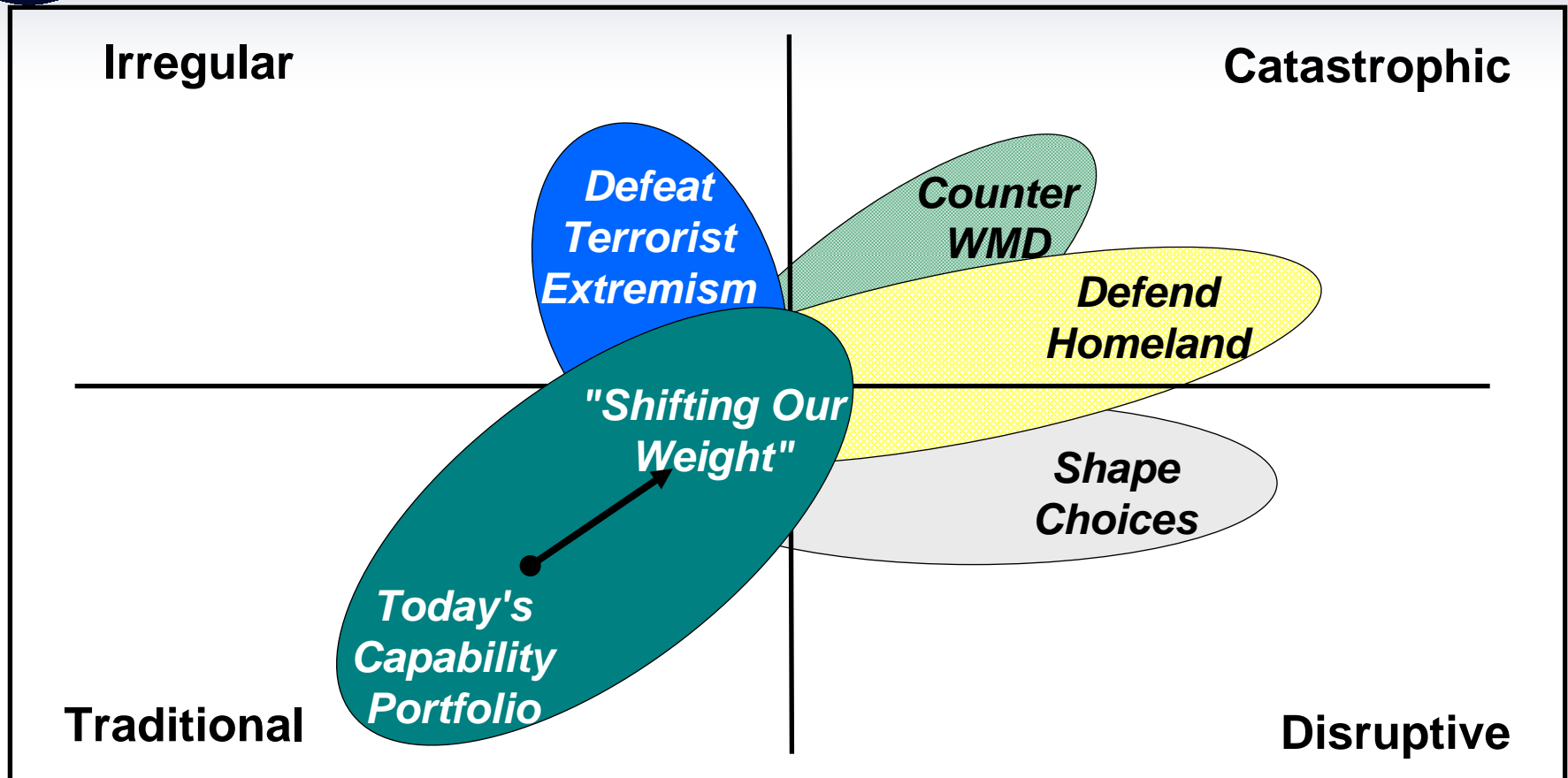
~~Un~~Certainty



VADM Terry Etnyre
25 October 2006



QDR 2006: *Shifting Focus*



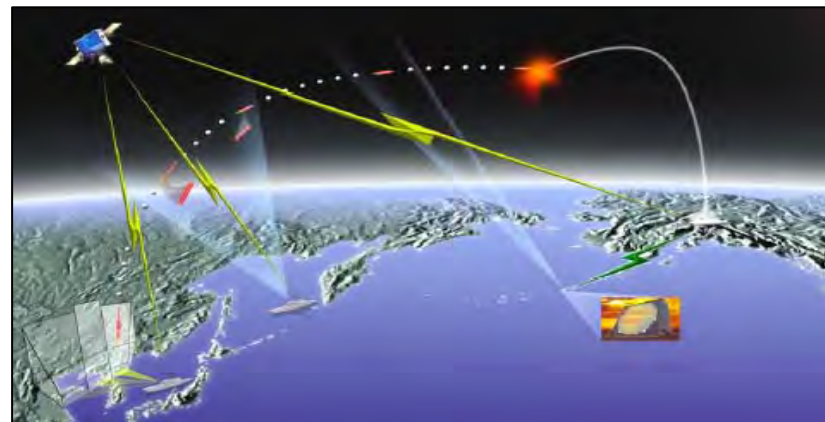
"This is a different world we're in today. It's unconventional instead of conventional; it's asymmetric instead of symmetric; it's irregular instead of regular; and it is so different for us that we need to...learn to fight this battle as effectively as we were successful with respect to the Cold War."

Secretary Rumsfeld, April 2006 2



Issues and Challenges

- Uncertain threats
 - MCO...The Long War...Tomorrow's Focus?
- Define Requirements
 - Prevent Requirements Creep
- What is the Right Mix?
 - Capabilities must meet the threat
- Resources
 - Must Control Costs





Future Fleet: 313 Ship Navy

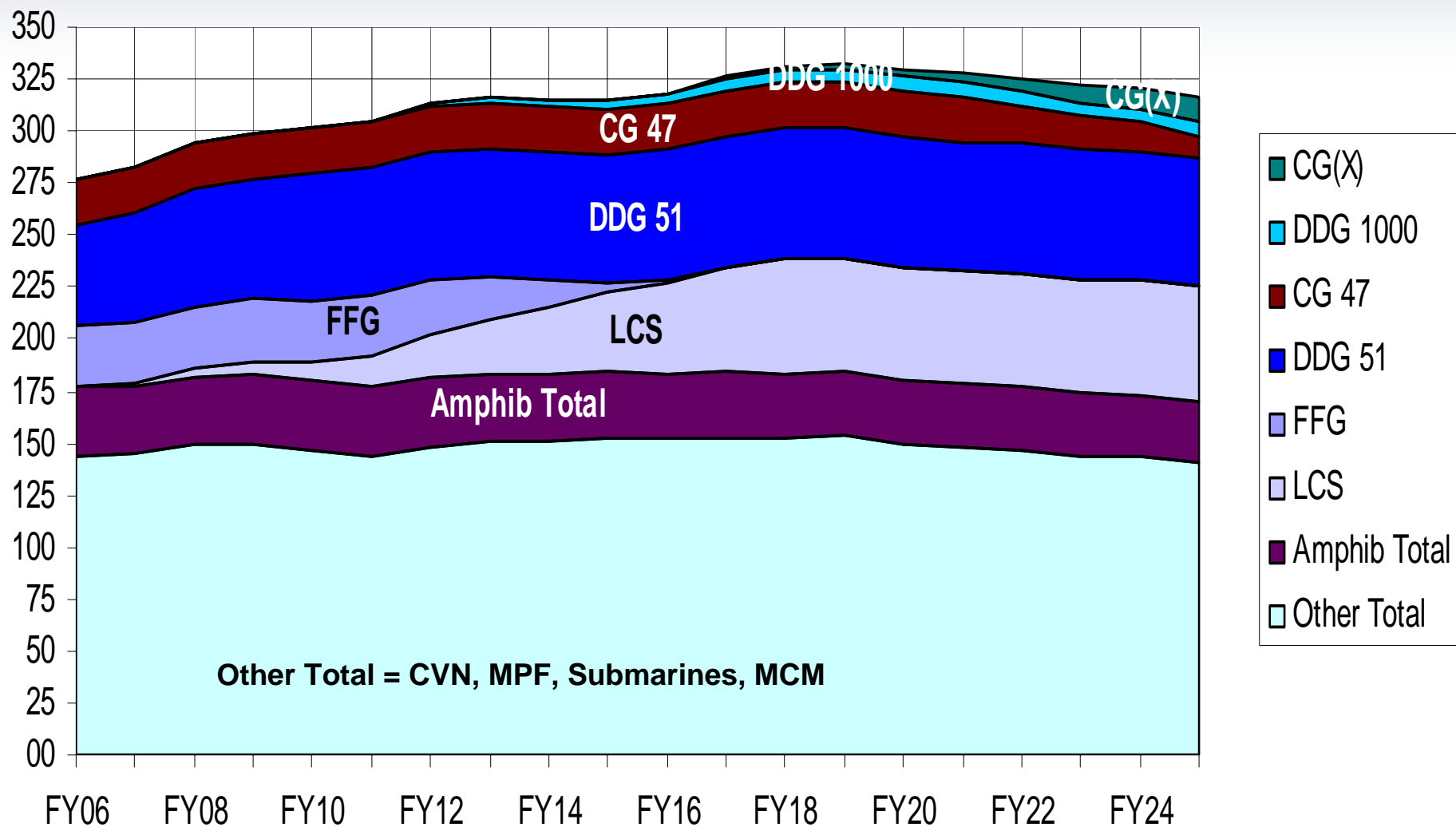
Type/Class	Required
Aircraft Carriers	11
Surface Combatants	88
Littoral Combat Ships	55
Attack Submarines	48
Cruise Missile Submarines	4
Ballistic Missile Submarines	14
Expeditionary Warfare Ships	31
Combat Logistics Force	30
Maritime Prepositioning Force (Future)	12
Support Vessels	20
Total Naval Force	313

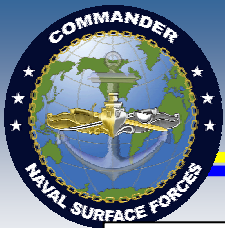


Balances Capability with Affordability



The Right Mix





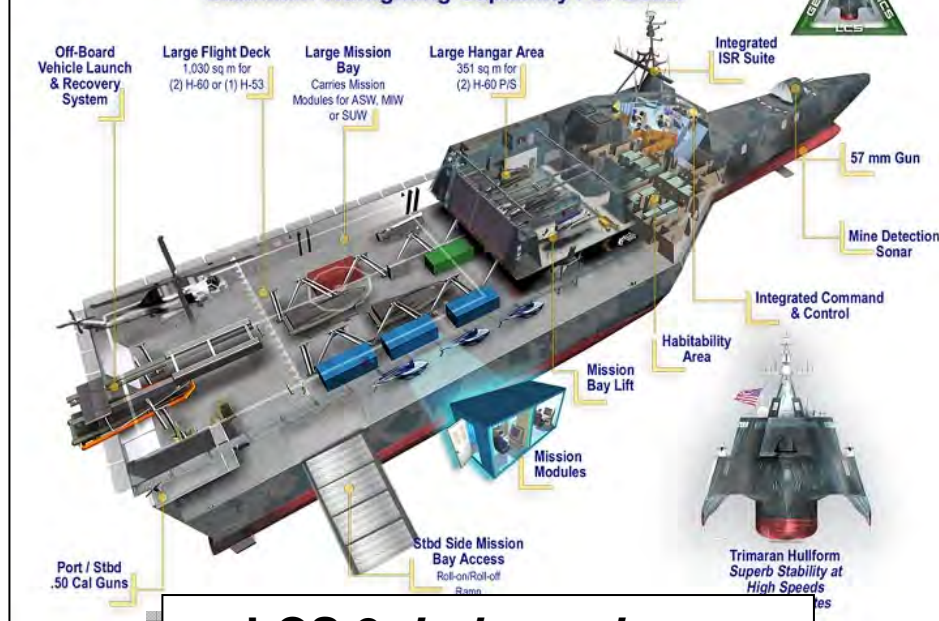
Capable and Affordable: LCS

- Access to the world's littorals
- Spiral Development
- 50 knot maximum speed
- Reconfigurable Mission Modules
- Optimally Manned Crew
- Entering the Fleet in 2007

LCS 1, *Freedom* Lockheed-Martin Design



Maximum Warfighting Capability Per Dollar



LCS 2, *Independence* General Dynamics Design

LCS will have an immediate impact in the Global War on Terror



LCS Design Concept



Fast,
Maneuverable,
Shallow Draft
Hull



Total Ship
Computing
Environment



Air &
Watercraft
Capability

C4I
Navigation
Self Defense
Radar
Vehicle Control
Maint & Support



Core
Systems

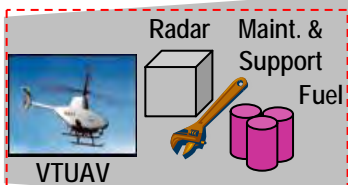
Core
Crew



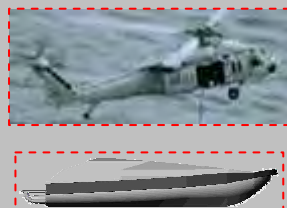
Core
Capabilities



Interface



Mission
Systems



Mission
Modules



Mission
Crew

SEAFRAME

LCS



MISSION
PACKAGE

Focused
Capabilities
MIW
ASW
SUW



Affording the Future Fleet

- Navy Strategic Plan
 - Focus on Capabilities
 - Build to the Requirement
- Modernization
 - Prevent early retirement
- Sea Enterprise
 - Transformation
 - Navy Enterprise Construct



***Meeting warfighting requirements at an affordable price
and acceptable level of risk***



Modernization

Mission Life Extension Upgrades CG Baselines 2,3,4

BMC4I

CEC (Variant)
SGS A/C (B/L 2)
CDLMS (B/L 2)

AIR DOMINANCE

7 PH 1C computer program
COTS computing plant
Radar and Display upgrades
VLS Modifications

FORCE PROTECTION

ESSM
CIWS BLK 1B
SPQ-9B (ASMD)
SARTIS
SQQ-89A(V)15 (B/L 3 & 4)

GUN WEAPON SYSTEM

(2) 5 inch/62 Guns
MK-160 Gun Computing System
OSS

HM&E

All Electric Mods
Smart Ship Upgrades
Structural Modifications
Quality of Service Upgrades

B/L 2=CG52-58
B/L 3=CG59-64
B/L 4=CG65-73

**Getting full service
lives from existing
ships is a critical
enabler in affording
our future**

**Avoiding early-
retirement requires
commitment to
keeping these ships
relevant**

DDG-51 Class

AIR DOMINANCE

CIC Display Upgrades
Open Architecture Computing Plant
VLS Mods (ESSM)
AWS CR-3 Computer Program
Multi-Mission SIGPRO
SPY-1D Transmitter Upgrades
Multi-Mission BMD
IABM (SIAP)
SM6/NIFC-CA (IOC FY14)
FCS STAMO Upgrades
CEC

C4I

NAVSSI BLK 4
IFF Mode 5

FORCE PROTECTION

CIWS-1B
NULKA
SEWIP
SSTD (ATT) – IOC FY13
MK 54 Torpedo/DFCI
SQQ-89A(V)15 w/MFTA

HM&E

Full IBS Upgrade
MCS/DCS Upgrades
GEDMS
Wireless Communications
Digital Video Surveillance
Quality of Life Upgrades
Advanced Galley
Mission Life Extension Upgrades

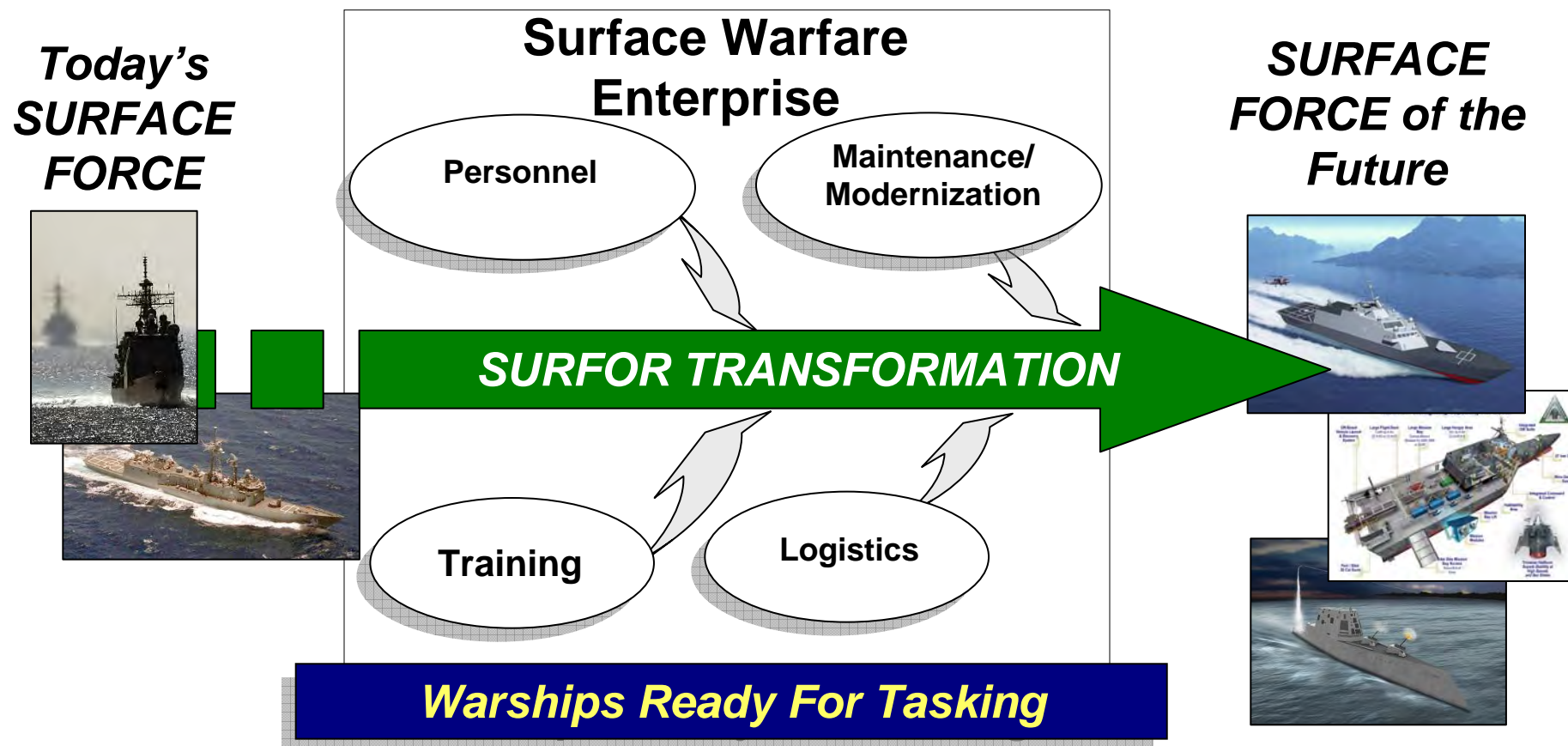
GUN WEAPON SYSTEM

MK-160 Mod X Gun
Computing System



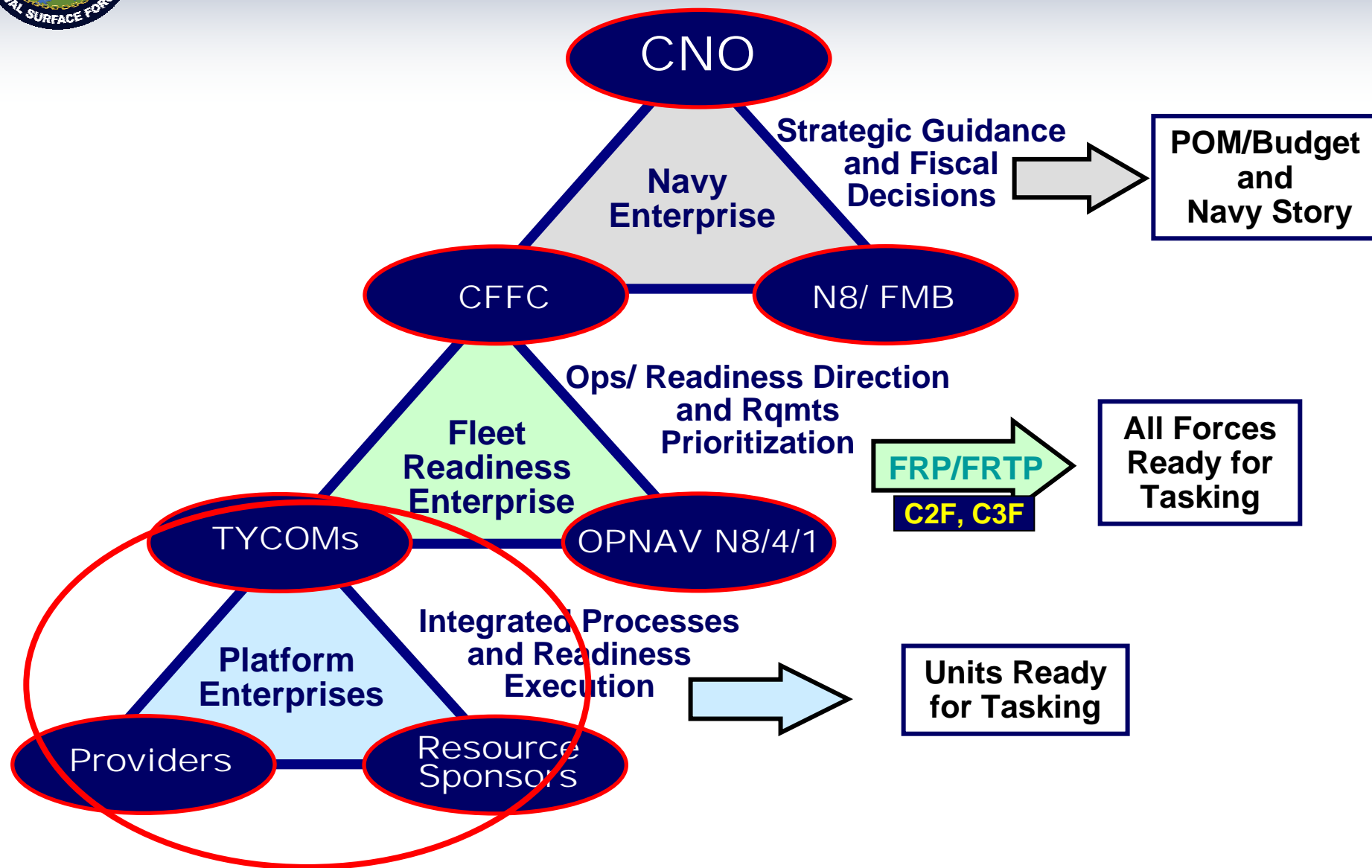
Surface Force Transformation

CNSF Mission: *Deliver trained, highly effective, and technologically capable Surface forces that are certified across a full spectrum of warfare areas...*





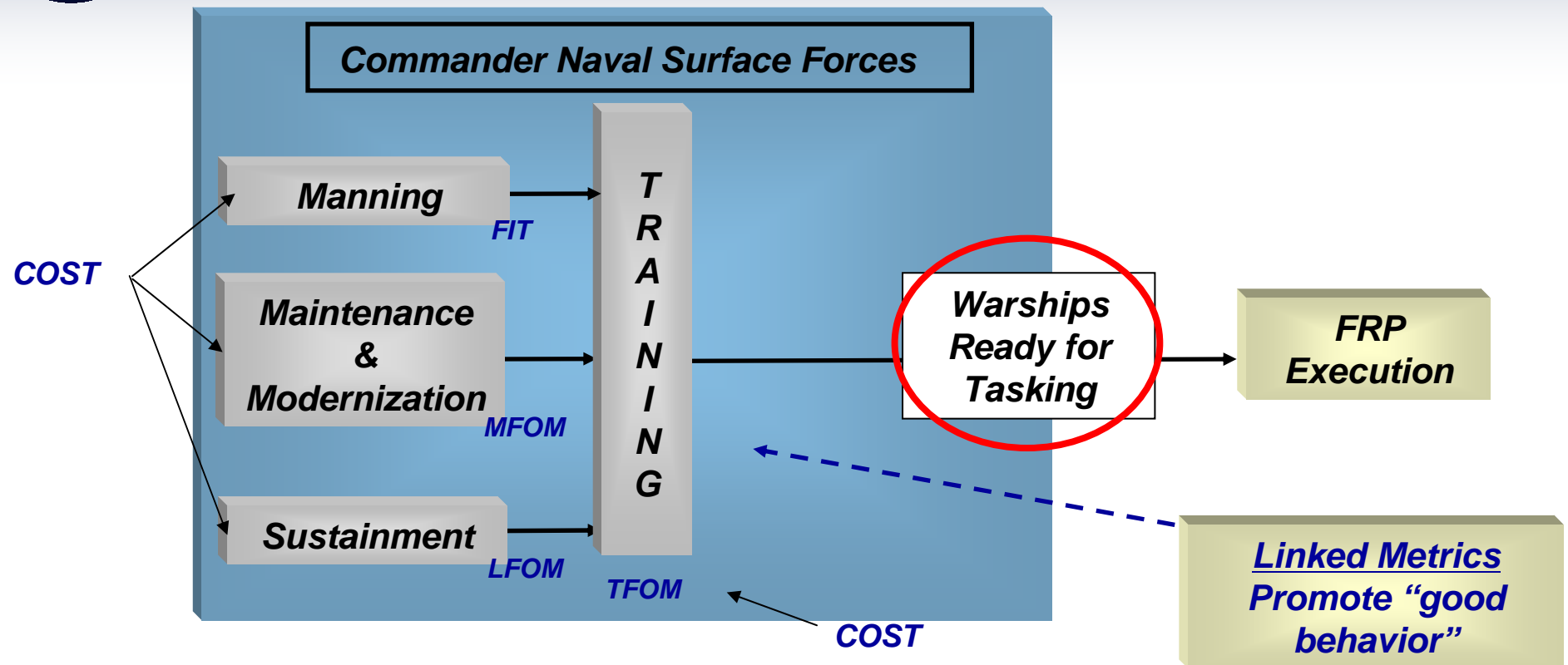
Navy Enterprise Construct



Output = Readiness / Cost



Surface Warfare Enterprise



For each process, measure output vs. demand, and measure cost

Productivity is Key



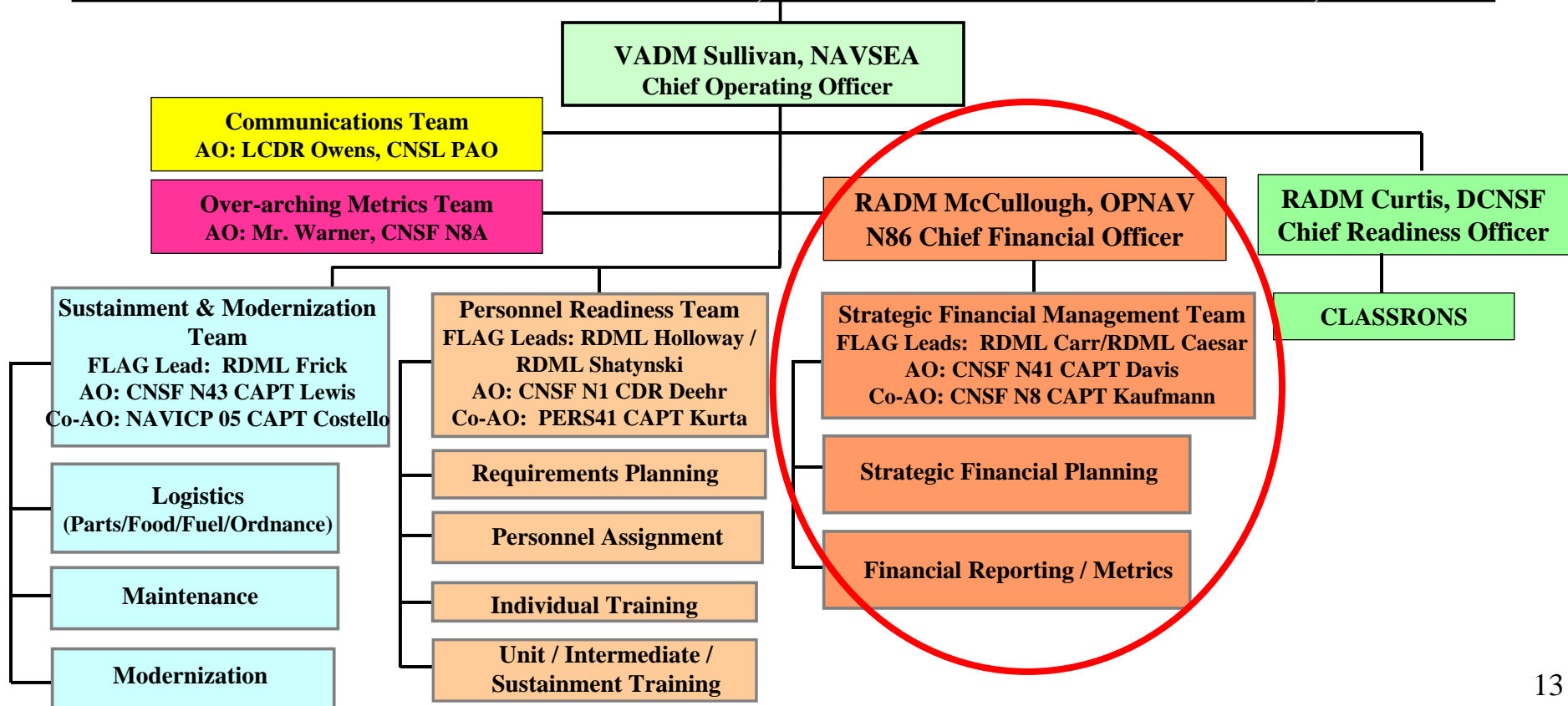
SWE Oversight

* EXCOMM

- *VADM Sullivan, NAVSEA
- *RADM Curtis, DCNSF/CNSL
- *RADM McCullough, OPNAV N86
- *MGEN Benes, OPNAV N85
- *RADM Hamilton, PEO SHIPS
- *RDML Campbell, OPNAV N43B

SWE Board of Directors (BOD)

- *VADM Etnyre, CNSF
- RADM Thompson, OPNAV N41
- RADM Nowakowski, INSURV
- RADM Stone, NAVSUP
- RADM Reilly, MSC
- RADM Hugel, SEA 04
- RDML Orzalli, RMC Commander
- RDML Holloway, PERS4
- RDML Carr, OPNAV N86F
- RDML Frick, PEO IWS
- RDML Goddard, V-NAVSEA
- RDML Shatynski, CNSF
- RDML Pottenger, MSFSC
- RDML Buzby, OPNAV N86B
- RDML Deets, NNWC
- Jeff Klein, SPAWAR
- James Thomsen, PEO LMW





Strategic Cost Management

Variance analysis for course corrections

Cost Area	Targeted %	Actual %	Variance %	Corrective Plan
RD&E	14	21	7	
Procurement	32	14	(18)	
O&S	32	35	3	
Manpower	22	30	8	

The Inspiration - Shipbuilding Plan

Nuclear probability assessment															
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
RD&E	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Procurement	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
O&S	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
Manpower	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
TW&D-CLT	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
REFINE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Self-maint	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105
RD&E	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Procurement	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
O&S	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
Manpower	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
TW&D-CLT	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
REFINE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Self-maint	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105
Nuclear base financing															
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Ship Driven Costs



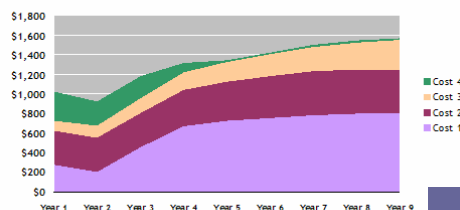
- Weapons
- Crew and shore support
- Maintenance
- Modernization
- Consumables

Continuing Improvement

Inspiration

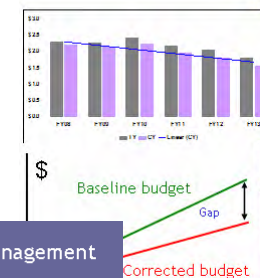
Cost Analysis

Capturing the gains



Disciplined Cycle

Financial Analysis

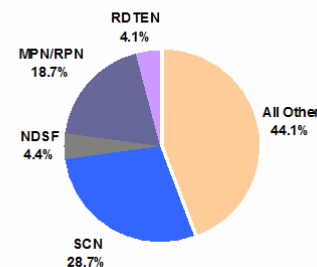


Savings

Generate and implement the opportunities

Initiative (Examples Only)	Start	Estimated Completion	Champion	Estimated Value
1 Diesel Engine Program	Aug 06			TBD
2 CLASSRON	Oct 06			TBD
3 R&D Productivity	May 07			TBD
4 Requirements	Jan 07			TBD
5 Call Centers	Nov 06			TBD
6 PBL	Feb 07			TBD

Cost targets guide our resource management



Gap Identification

Specific Action Plans

Cost Model



A Fleet for the Future

- 30 Year Shipbuilding Plan
 - 313 Ships
 - Provides Structure and Stability
 - Balances Capability and Affordability
- Affording the Future
 - Control Costs
 - Modernization
 - Enterprise Approach



Balanced, Rotational, Forward Deployed, and Surge Capable

Discussion





Recapitalizing the Navy's Battle-Line



**Brief to National Defense Industrial
Association (NDIA) Conference**

CDR Greg Gombert
Deputy, Shipbuilding Mgr
Warfare Integration Division (OPNAV N8F1)
25 October 2006



A Maritime Nation at War:

230 Years of Courage Under Fire

Sea Power in a New Era:

A 1,000 ship Navy – leveraging allied and coalition Naval Forces

A Balanced Force:

Right Size, Right Mix, Right Capabilities, Right Cost



NAVY STORY



The Navy Today

• Global War on Terrorism

–A Direct Navy Issue!

- Over 28,000 Marines and ~19,500 Navy (ground/shipboard) personnel engaged in CENTCOM AOR in support of GWOT
- Naval medical personnel deployed to Iraq in support of Marine forces
- CSG and ESG provide continuous on station CENTCOM AOR operational & combat support

–Indirect Navy commitment

- Global engagement and partner nation support
- Stability operations in the Philippines and elsewhere
- Humanitarian assistance and disaster relief throughout the world

• Maritime Presence, Domain Awareness and Supremacy

–Navy's core competencies!

- Worldwide presence with a purpose – deterrent shield against major combat operations across the globe
- Transitioning from legacy to revolutionary platforms
- World Class people
- Heavy investment in transformational technology
- Platforms and people postured for short duration high intensity conflicts

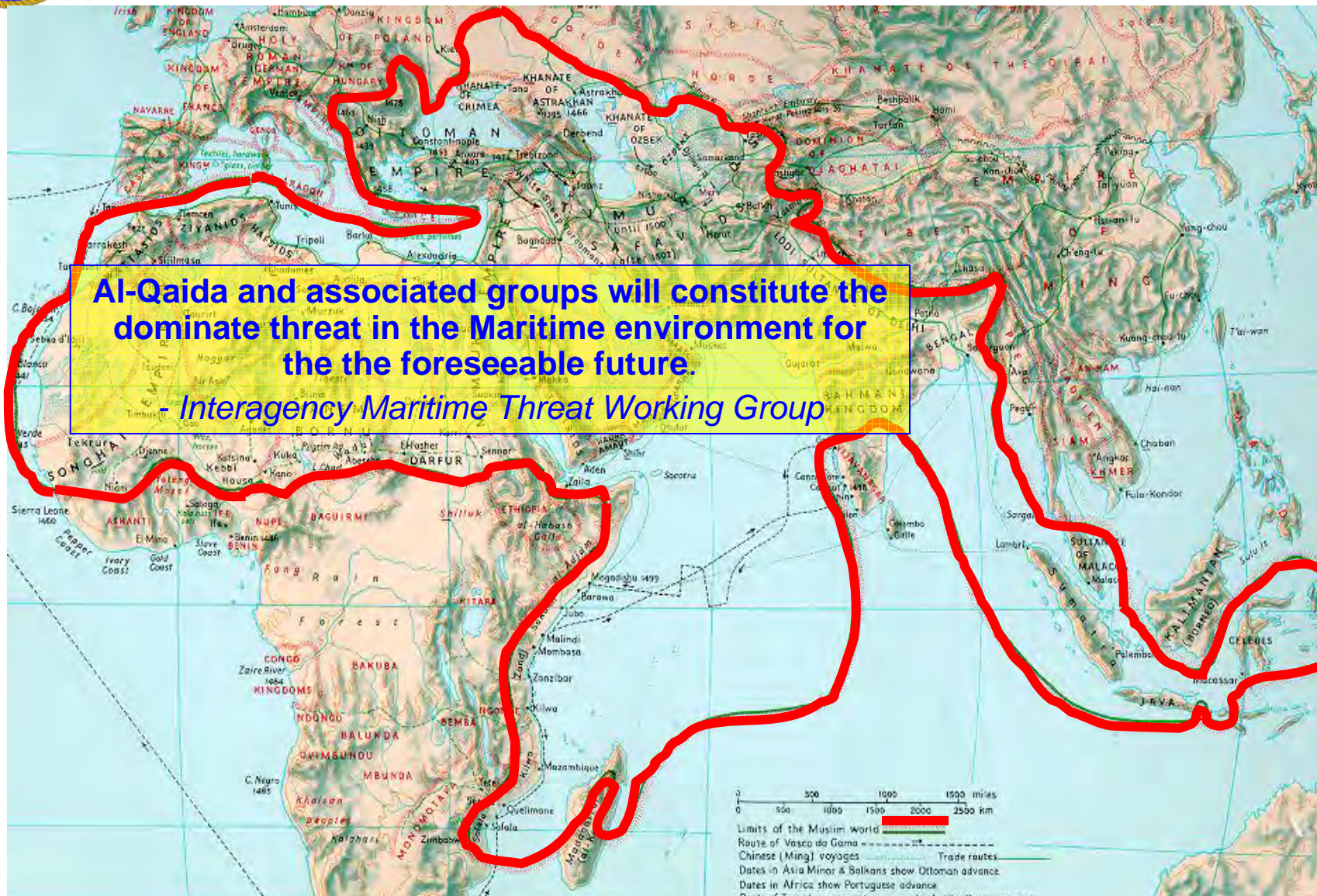


We must remain prepared, strong, and ready to meet the challenges of the future . SECNAV JAN 06



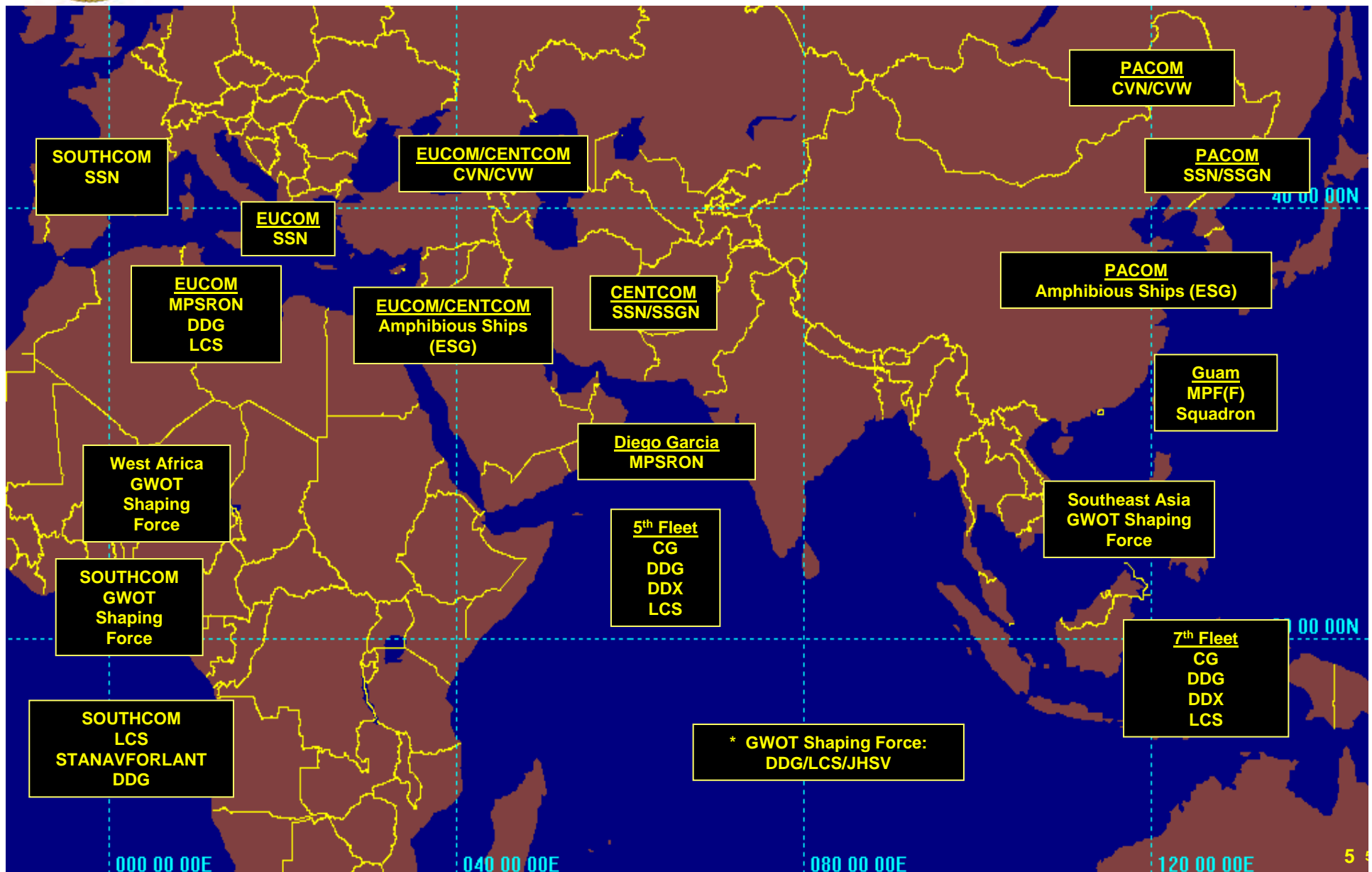
GWOT

What we are up Against



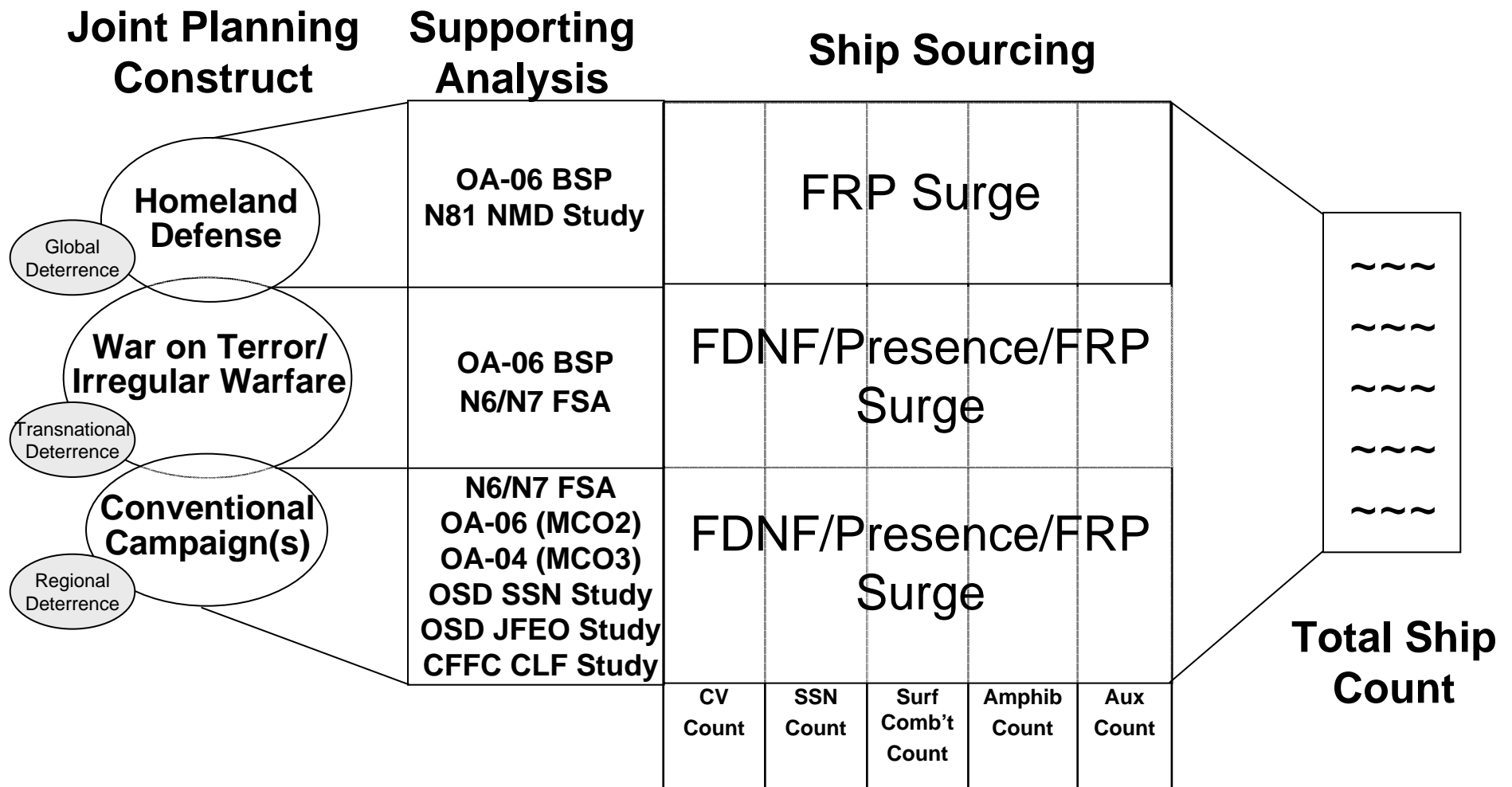


Force Demand





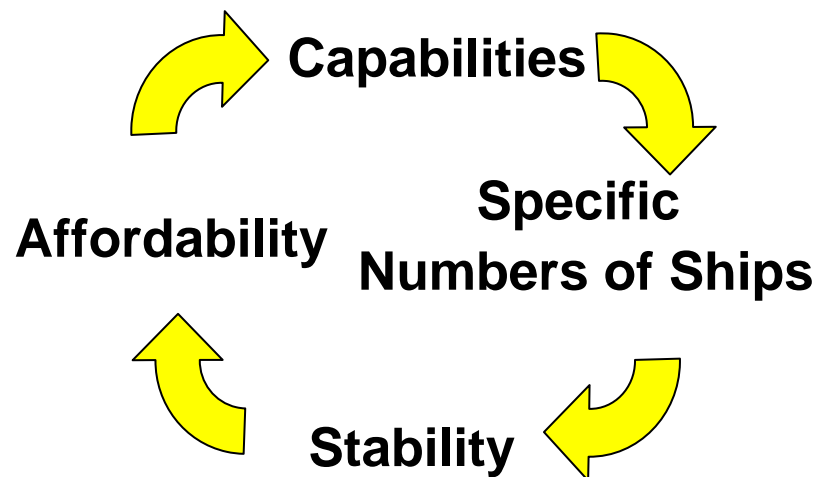
Analytic Basis



All platform types analyzed in common, integrated frame of reference



Future Force Structure



- **Generally accepted by all analytic bodies (CBO, CSBA, PA&E, etc.)**
 - Appropriate force content for the anticipated threat
 - Issues are not with the force content
 - Rather, they are about affording this force level

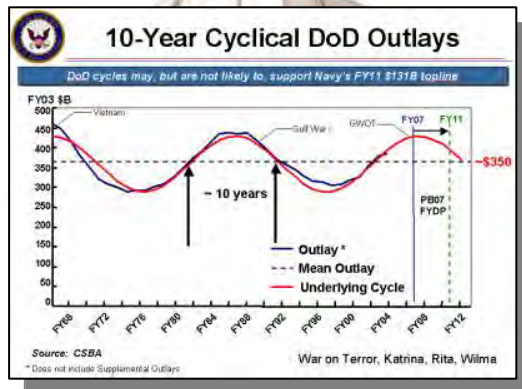
Ship Type	Today 2006	2013 PB07	2020 Force Structure
CV/CVN	12	10	11
CG	22	22	19
DDG	49	62	62
DD(X)	0	2	7
FFG	30	20	0
LCS	0	27	55
Dedicated MIW	16	14	0
SSBN	14	14	14
SSGN	4	4	4
SSN	55	55	48
Expeditionary	33	32	31
MPF(F)	0	4	12
CLF	30	30	30
Command & Support*	16	21	20
Total	281	317	313

*Includes T-AGOS, T-ARS, AS, T-ATF, LCC, AGF



Fiscal Environment

...Can't do everything...tradeoffs and risk mitigation required



Resources

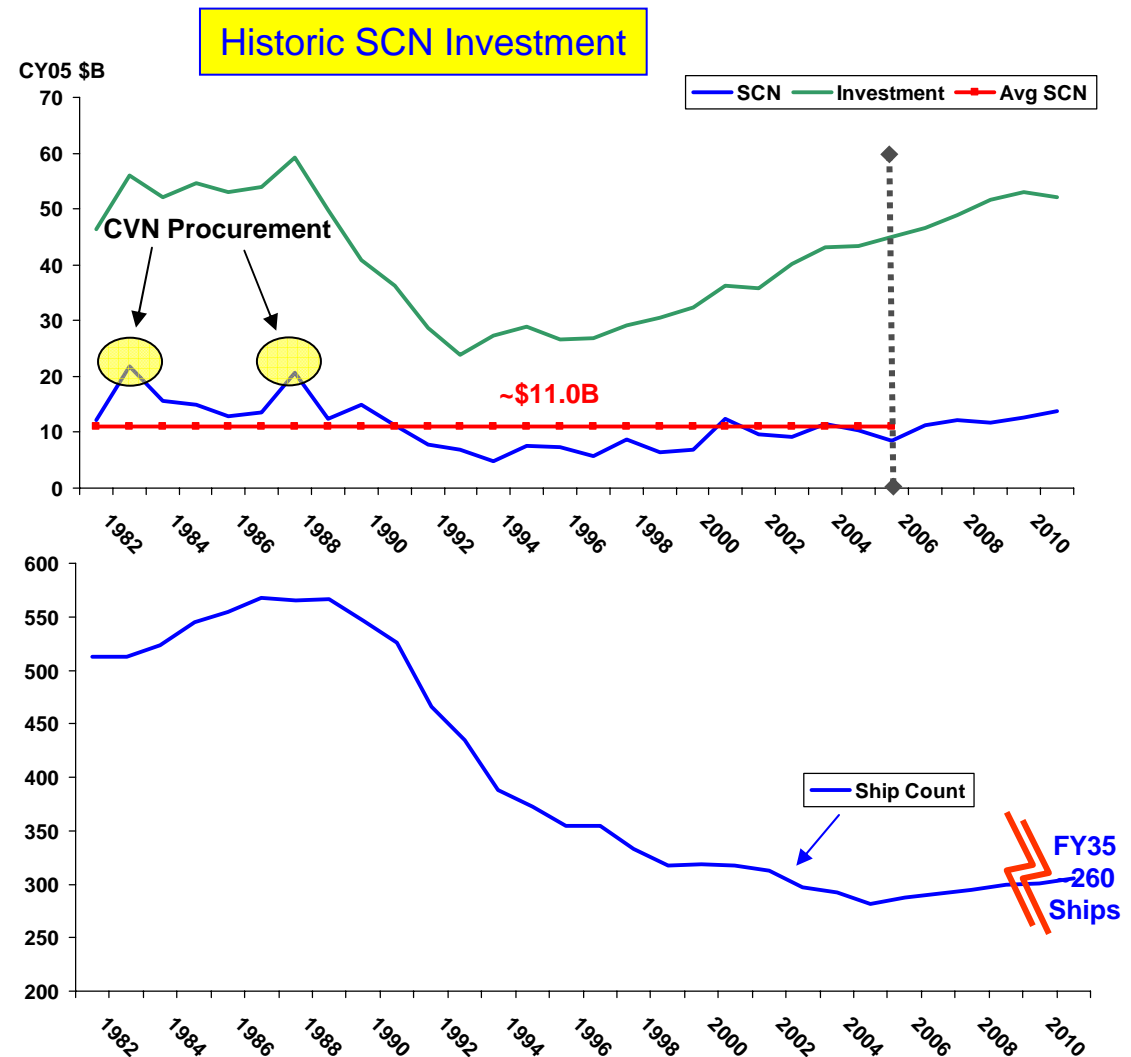


Requirements



Shipbuilding Affordability

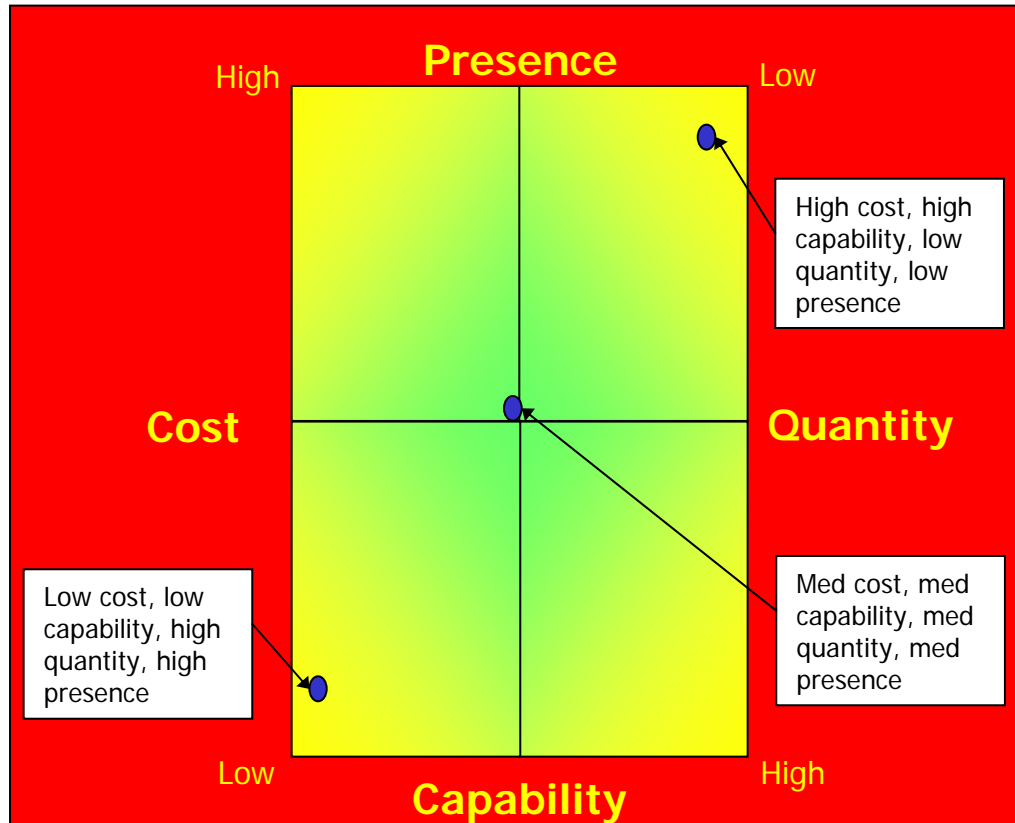
- Historical figures indicate Navy has invested ~\$11B annually (FY05\$) in new ship construction
 - Only supports ~260 ship Navy over long term
- Warfighting requirement for capacity and capability is 313 ships
 - This requires ~\$13.4B(FY05\$) in new construction shipbuilding
- Affording the Navy's future is the cornerstone of forward presence
 - We must specify our requirements and justify the investment
 - Commitment to the number of ships, build plan, and investment strategy is critical
 - Stability will assist in meeting affordability goals



Specificity → Stability → Affordability



Tradespace



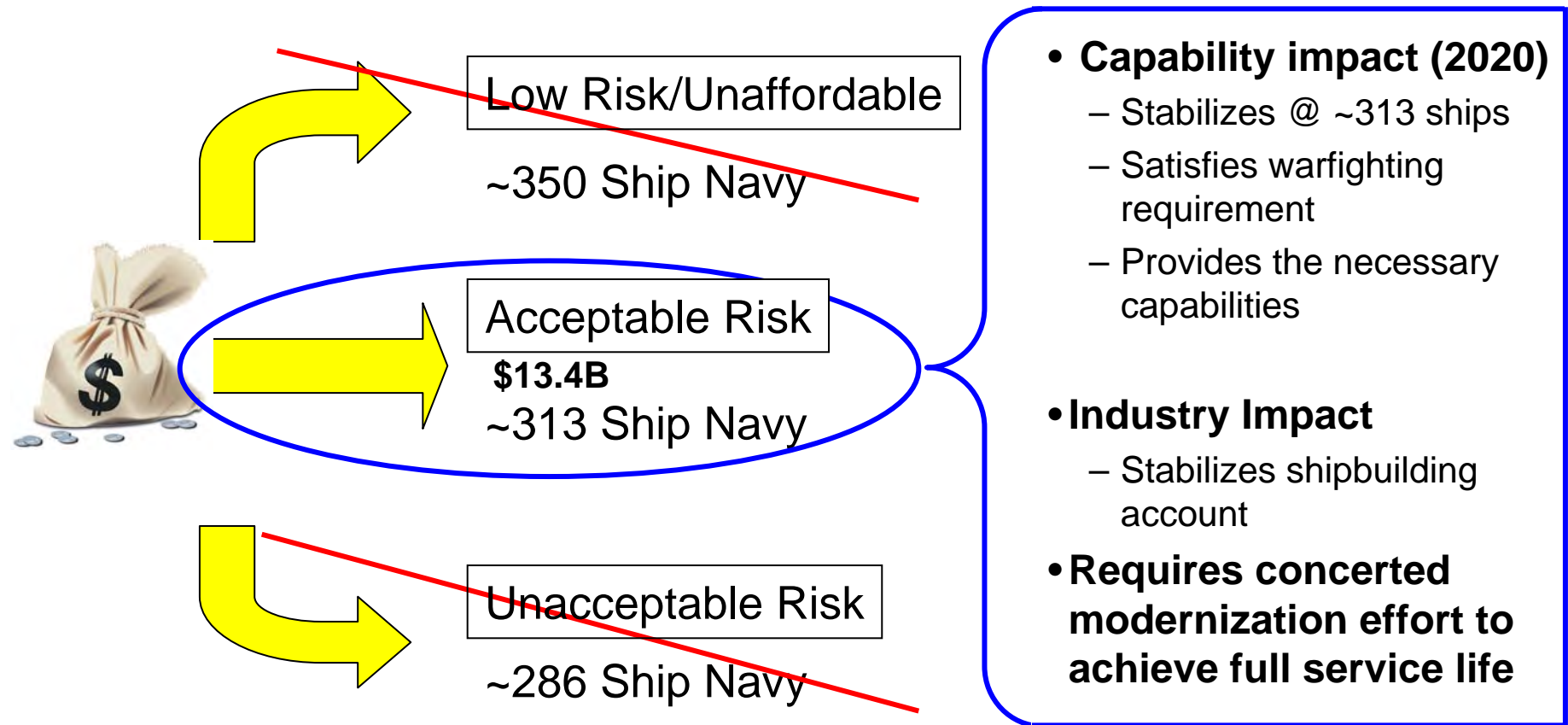
- **Goals:**

- Achieve balance between resources and requirements
- Fill any gaps in “What it Takes to Win”
- Prioritize Navy around CONPLAN 7500
 - Don’t “give away” an MCO
 - But, assume more risk where appropriate
- Risk priority:
 - CONPLAN 7500
 - MCO2
 - MCO1
 - MCO3

Options for recapitalization are limited by the need for relevancy, capability and capacity - maintaining the balance between quantity and quality is the challenge in today's Navy



Affordability



Aligned with risks accepted in QDR



Recapitalizing the Navy's Battle-Line

**Brief to National Defense Industrial
Association (NDIA) Conference**

**CDR Greg Gombert
Deputy, Shipbuilding Mgr
Warfare Integration Division (OPNAV N8F1)
25 October 2006**



NDIA Brief 2006

Captain Eugene Gray

Chief, Office of Security and Defense Operations
USCG Headquarters



National Security Cutter (NSC)

(Maritime Security Cutter – Large WMSL)



- **Provides capabilities for extended on-scene presence and forward deployment**
- **Upgraded capabilities for GWOT**
 - State-of-the-art C4ISR for improved interoperability
 - Common Operating Picture (COP)
- **57mm gun system with fire control radar**
- **Hull 1 Keel Laid
March 2005**





U.S. Coast Guard Port Security Unit (PSU)



- **Antiterrorism/Force Protection**
 - Seaports of embarkation/debarkation
 - Expeditionary and Domestic expertise
 - Adaptable force packages
- **6 armed smallboats/117 personnel**
 - Waterborne Security
 - Self Protection
 - Self contained





CASA CN-235 Medium Range Surveillance (MRS) Aircraft



- **Transport and surveillance, fixed-wing aircraft**
- **Multi-mission:**
 - SAR
 - Maritime Law Enforcement
 - Environmental Protection
 - Military Readiness
- **Sensors**
 - Inverse Synthetic Aperture Radar
 - Electro-Optical/Infrared (EO/IR)
 - Specific Emitter Identification





National Strike Force



- **Recognized experts in preparedness and response to mitigate the effects of hazmat incidents**
- **Highly trained cadre of specialist prepared to deploy on short notice**
 - Biological Response
 - Chemical Response
 - Oil Spill Response
 - Radiological Response
- **3 Strike Teams**





Questions?



Background Slides



- Counter-mine
 - DHS is the lead MOTR agency for interdiction of maritime threats in, and near, the U.S. USCG is primary DHS maritime asset.
 - DHS tasked with planning for prevention and detection of sea mining and swimmer operations in U.S. waters
 - Requires coordination between USCG, DoD, other DHS Agencies
- Small Boat Threat – waterborne IEDs
 - Area of evolving Tactics and capabilities
 - Regulatory / Legislative Issues
 - One shot-one kill as it relates to the Coast Guard Mission
 - US waters - Collateral damage is not an option
- Fielding anti-swimmer detection and response systems
- Prototyping Operations in CBRNE environment



U.S. Coast Guard National Defense Role



- ✦ Provide non-redundant, complementary resources that support the National Military Strategy
- ✦ Recognized USCG unique national defense capabilities:
 - ▲ Maritime Interception Operations
 - ▲ Military Environmental Response Operations
 - ▲ Port Operations, Security and Defense
 - ▲ Peacetime Military Engagement





- Coast Guard is a full partner with the COCOMs and Services overseas and domestically
 - Operations ENDURING FREEDOM & IRAQI FREEDOM
 - Integrated into NORTHCOM / PACOM response EXORDs to Homeland Defense events
- Domestic / Homeland Security is daily focus
 - Maritime transportation system critical to Nations economic power base and military force projection
 - Coast Guard works daily with DoD, federal, state, local and foreign agencies
 - Maritime Security
 - Disaster Response



- Coast Guard is uniquely situated to work with all key players in the maritime domain
 - Regulatory Agency working with industry (foreign & domestic)
 - Law Enforcement Agency working with all levels of Law Enforcement and Intelligence
 - Nation's 5th Military Service working with DoD, COCOMs and foreign coalition partners
 - Disaster Response Agency working with all levels of 1st Responders



- Maritime Sentinel
 - Strategic Plan for Combating Maritime Terrorism
 - Achieving Maritime Domain Awareness
 - Conducting effective maritime security operations
 - Overseas
 - On the high seas
 - US territorial sea and internal waters
 - Creating and overseeing an effective maritime security regime



- National Fleet
 - CNO / COMDT signed policy statement
 - Recapitalize forces – together!
 - Surface Combatants, major cutters, aircraft
 - Deepwater
 - Adaptable, interoperable, complimentary
 - Synchronize planning / training / procurement
 - Common Equipment & Systems
 - Interoperability improves mission effectiveness
 - Coast Guard is a partner / participant in the CNO's 1000 ship Navy organizing concept

Robotic Systems Joint Project Office



Ground Robots in War

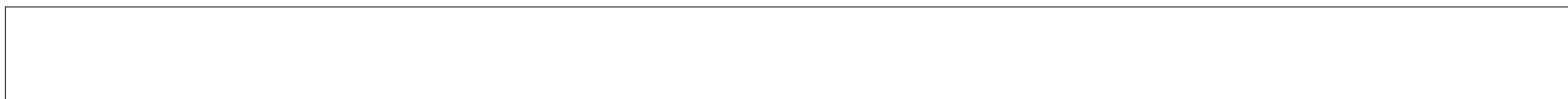
Presented to

Expeditionary Warfare Conference

26 October 2006



A “Sleeping Giant” Awakened





The World Changed



- **WWII History Showed...**
 - ...That a “Sleeping Giant” Awakened
 - ... Unprecedented Technology Development
- **9-11 Changed...**
 - ...Not Just the Way War Waged Against Us...
 - ...But, Once Again, the Way that We Respond
- **OIF/OEF History will Show...**
 - ... Surge in Technology Development/Application
 - ... Advent of Ground Robots in Combat



Evolution of Ground Robotics in War



2004 162 Systems

- No Single Vendor Could Produce 162
- 5 Vendors, Multiple Configurations
- Joint Effort, EOD Focused
- Joint Robotic Repair Facility Evolution

2005 1800 Systems

- Robots' Proven Ability to Save Lives
- Expansion Beyond EOD Mission
- Recognition of Need for "Single Bellybutton"
- MOAs with AMC and REF

2006 4000 Systems

- Continued Proliferation
- Engineers, Infantry, and Special Forces
- Route Clearance, Countermines, Weaponization.
- Pre-Deployment Training and Embedded Repair Teams (ERTs)
- Supply Chain Management of COTS



The Cost in Lives



WAR	US Deaths per Day
World War I	200
World War II	219
Korea	32
Vietnam	19
Iraq	2

Thousands of Ground Robotic Missions
Have Saved Lives...

GROUND ROBOTS WILL SAVE MORE!

Acquisition Excellence



A Service Member.... or a Robot



Acquisition Excellence



Ground Robots in Action



- Over 150 Missions a Day
- More Than a Thousand Systems Destroyed



Acquisition Excellence



Ground Robots in Action



Acquisition Excellence



“Robotics 101”



- **Definition**

- **Webster's (Robot): A Machine or Device That Works Automatically or by Remote Control**
- **Military Application: Remote Combat Tasks to Accomplish the Mission and Save Friendly Lives**

- **Components**

- **More than Vehicles**
- **System (Chassis, Control Unit, Payload)**
- **Software Intensive**

- **Levels of operation**

- **Tether**
- **Tele-op**
- **Semi-Autonomous**
- **Autonomous**

**Toolbox
Concept**



Legacy Systems



Panther

- **Panther**
 - Anti-Tank
 - Abrams with Roller
 - From Bosnia / Kosovo
 - To Iraq



Mini Flail

- **Mini Flail**
 - Anti Personnel
 - Bosnia / Kosovo
 - Afghanistan
 - Retired



MATILDA

- **MATILDA**
 - Ft. Leonard Wood
 - Deployed OIF / OEF
 - Retired



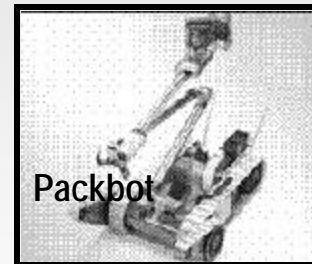
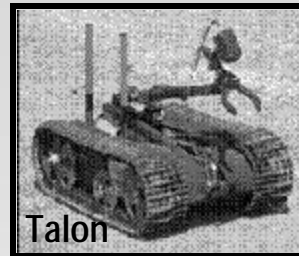
Current Systems



PROGRAMS OF RECORD

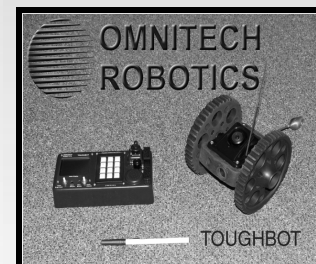


IED SYSTEMS



Global
JRRFs/ERTs

MULTIPLE S&T EFFORTS





ABV- Remote Control System



Assault Breacher Vehicle (ABV)



Acquisition Excellence



MV 4



DOK-ING MV4



Acquisition Excellence



Gladiator



Gladiator



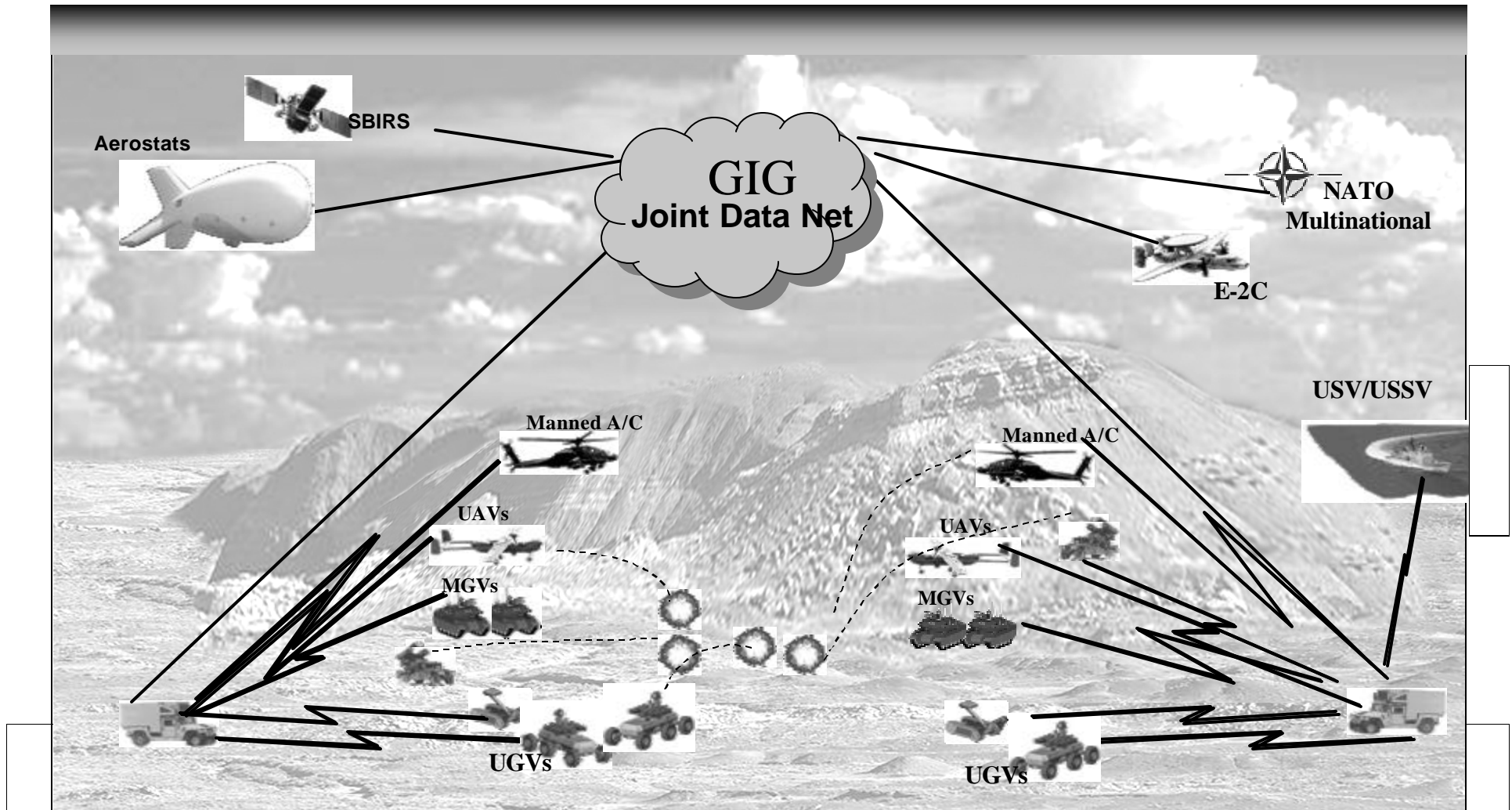


The Future? COLLABORATION



- Interoperability
- System of Systems
- Joint Shared Integrated Picture

- Sensors, Shooters, Command, Control & Communications
- Reconnaissance/Surveillance





FCS Ground Robotic Systems



**Armed Robotic Vehicles-Assault-Light
(ARV-A-L)**



**Multifunctional Utility/Logistics and Equipment
MULE-Transport**

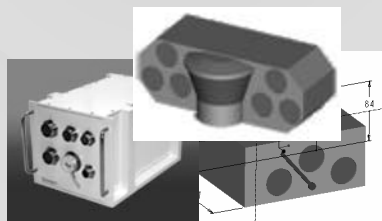


**Small Unmanned Ground Vehicle
(SUGV)**



Countermine-Mule

**Armed Robotic Vehicles
ARV-RSTA**



**Autonomous Navigation System
ANS**

**Armed Robotic Vehicles
ARV-Assault**



Acquisition Excellence



Ground Robotic Master Plan



- **GRMP Links Unmanned Systems S&T to Capability**
 - Army-Marine Corps Activity (Not OSD “JRP Master Plan”)
 - Systems Engineering Rather Than Ad Hoc Approach to Master Plan
 - Partnered with PM UAS and Defense Acquisition University
 - OSD JGRE (Previously Called JRP) to Have Similar Initiative 2007
- **Technology Assessment & Transition Management (TATM)**
 - Uses Capability Assessments / Gap Analyses
 - 2 Key Components: Database/Tool Kit and a Process
 - Use of Data (e.g., Technology Maturity & Criticality)
 - OIPT/WIPT Process to Make Decisions/Recommendations
 - 4 Overarching Stakeholders User / S&T / PM / Sustainer
 - Results in a Published Plan and Signed TTAs
- **Stages**
 - Version 1.0 July 2005 Army-Marine “Catalog,” Not a “Plan” (Data Only)
 - Version 2.0 September 2006 Army-Marine Closer to “Plan” (Used Data & Process)
 - Version 3.0 June 2007 to Become First “Plan” (Tied to POM Process, Signed TTAs)



Help Needed



- **Think JAUS (Joint Ground Interoperability Standard)**
- **Common OCU (Driven by Requirements)**
- **Improved Network Interoperability**
- **MANPRINT Standardization**
- **Logistical Efficiencies**
- **Budgetary Challenges**

Now More Than Ever...

...Because the World Changed



We Must Never Sleep Again





Robots Don't Sleep

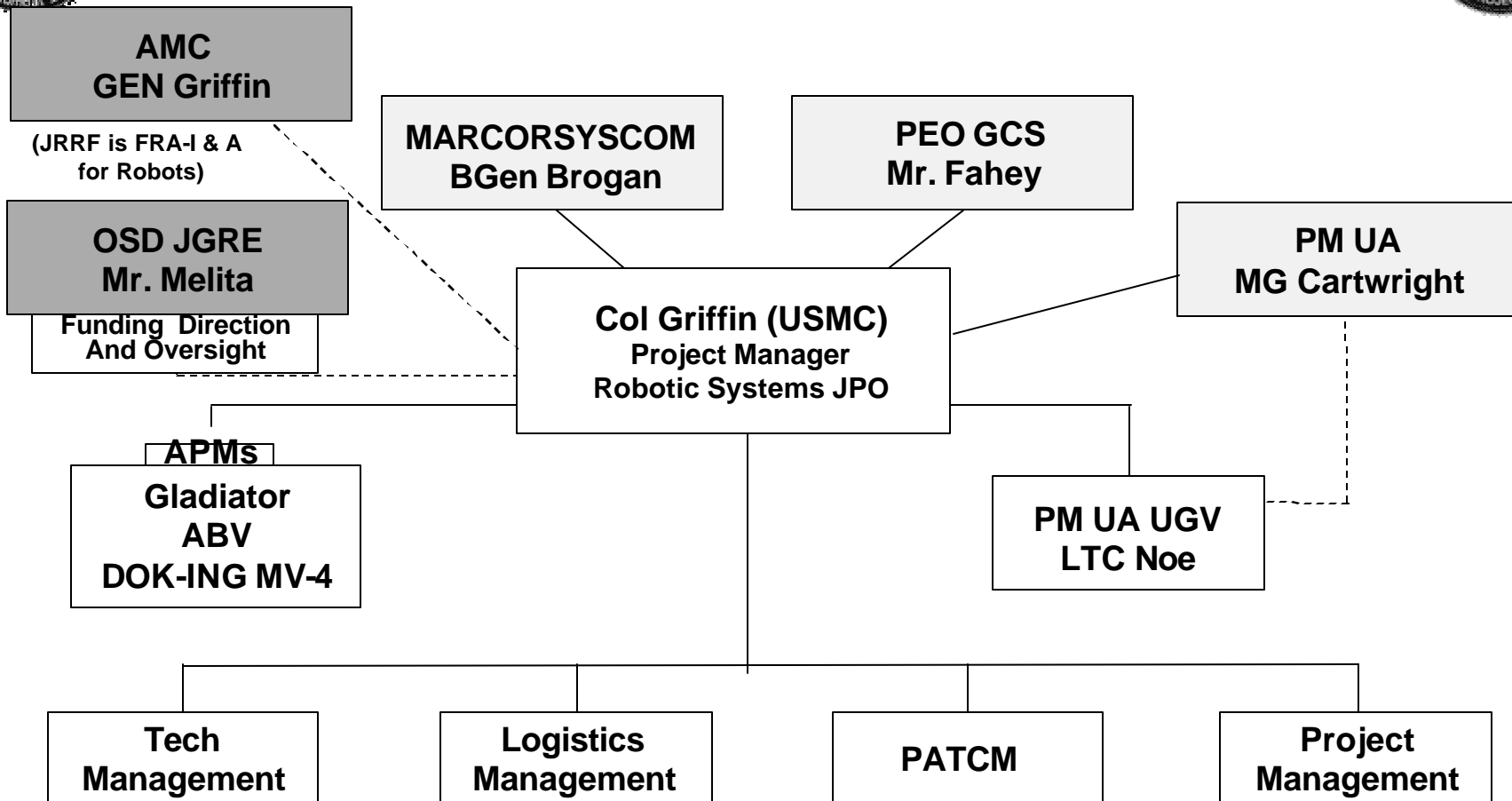




BACK-UPS



Robotic Systems Joint Project Office



Army – Marine MOA

Over 20 Robotic Systems

Chartered by AAE

Acquisition Excellence



Rapid Fielding “1-2-3 Process”

- **“1” Tech Insertion Experiment (Funding Varies)**
 - “1-a” CONUS Assessment Before OCONUS
 - “1-b” Theater 90 Days if “1-a” is Favorable
 - Pre-Deployment Sustainment and Assessment Plan
- **“2” ONS/UNS (GWOT, JIEDO, REF Funding)**
 - If OCONUS “1-b” Assessment is Favorable
 - More Robust Sustainment and Assessment Plan
 - Process Link to Formal Requirements Domain
- **“3” Enter Formal Acquisition Process**
 - Feeder Requirement or New Requirement
 - More Rapid Acquisition (Enter at MS B or MS C)



Challenges & Opportunities for Industry

- Autonomous Mobility
- Autonomous Mobility Performance
- Perception Safety (Moving Persons and Vehicles)
- Navigation Challenges (Adverse Weather, Negative Obstacles)
- System Control Devices
- Autonomous Operations
- Development of Tactical Logic/Command Control
- Non-Line-of-Sight Communications
- Non-Active (Stereo) Perception
- Reliability/Availability
- Anti-Tamper Capability
- Lightweight, Rugged Components
- Improved Battery Technology

Program Executive Office



SHIPS

**We Are Ships
From Cradle to Grave**

NDIA Expeditionary Warfare Conference: Force Structure Panel

*RADM Charles Hamilton, PEO Ships
25 October 2006*



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- **Sustain Combat Readiness**

- Right combat capabilities – access, speed, agility, adaptability, persistence, awareness and lethality – for the right cost.

- **Build a Fleet for the Future**

- Balanced, rotational, forward deployed and surge capable
- Proper size and mix of capabilities
 - empower enduring and emerging partners
 - deter adversaries
 - defeat enemies

- **Develop 21st Century Leaders**

- Through a transformed manpower, personnel, training and education organization that better competes for the talent our country produces and creates the conditions in which the full potential of every man and woman in our Navy can be achieved

Navy Shipbuilding Plan



Program Executive Office, Ships

Ship Class	FY06	FY07	FY08	FY09	FY10	FY11	FY07-11
CVN 21	-	0	1	-	-	-	1
SSN 774	1	1	1	1	1	1	5
DDG 1000	-	2	0	1	1	1	5
CG(X)	-	-	-	-	-	1	1
LCS	3	2	3	6	6	6	23
LPD 17	1	0	1	-	-	-	1
LHA(R)	-	1	0	-	1	-	2
T-AKE	1	1	1	1	1	1	5
MPF(F)	-	-	-	0	0	0	0
MPF Aviation	-	-	-	-	-	1	1
MPF LMSR	-	-	-	-	1	1	2
MPF MLP	-	-	-	0	-	1	2
Intratheater Connectors	-	-	-	1	1	1	3
Sea-Shore Connectors	-	-	-	-	1	4	5
Total New Construction	6	7	7	11	12	14	51

Congress authorized and appropriated funding requested in the 2007 President's budget for DDG 1000, LCS, LHA(R), LPD 17 and T-AKE

- DDG 1000 program received authorization to proceed with Dual Lead Ships strategy
- Cost caps placed on DDG 1000 (lead ships), LHA(R), LPD 17 ships 22-25

Obstacles to Designing Affordable Ships



Program Executive Office, Ships

- **Getting early, documented, validated requirements, informed by cost**
 - Analysis of ship cost must include complexity, ship density, degree of warfare system integration and propulsion plan configuration in addition to labor and material costs
- **Rising costs in combat systems and C4ISR suites, with limited user appetite suppression (“better” is the enemy of “good enough”)**
 - Weapons systems are approximately 40% of total cost on warships in the FYDP
- **Material demand (global steel market) and vendor base**
 - Material sourcing by parent shipbuilding corporations could be improved to coordinate leveraged material buys within the shipyards they own

Solutions to Shipbuilding Acquisition



Program Executive Office, Ships

- **Streamlining the Shipbuilding Acquisition Process**
 - Technology Maturation Model
 - CAIV Model
 - Requirements Model
 - Producibility Model
 - Lifecycle Optimization Model
 - Partnering Model

Affordability Considerations



Program Executive Office, Ships

- **Technology Maturation Model**
 - Produce Engineering Development Models (EDMs) to elevate Technology Readiness Levels (TRLs) and gain mature cost insights from actual production of representative subsystems
- Example: DDG 1000 EDMs**



DDG 1000 Critical Technologies



Program Executive Office, Ships

Infrared Mockups (IR)

- Land-based suppressor testing complete
- At-sea panel testing complete



Integrated Composite Deckhouse & Apertures (IDHA)

- RCS testing complete
- Co-site testing complete



Dual Band Radar (DBR)

- MFR land-based testing complete
- VSR final array assembly complete



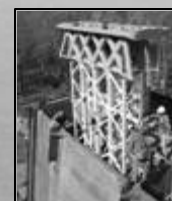
Advanced Gun System (AGS)

- Initial guided flight testing complete
- Land-based testing complete



Peripheral Vertical Launch System (PVLS) / Advanced VLS

- Two detonation tests conducted
- Missile restrained firing testing complete



Integrated Power System (IPS)

- Component factory testing complete
- Critical Test Parameters (CTPs) complete



Autonomic Fire Suppression System (AFSS)

- At-sea weapons effect and autonomic fire suppression testing demonstrated



Total Ship Computing Environment (TSCE)

- Software Releases 1, 2, and 3 successfully coded, tested, and authorized by the Government



Hull Form Scale Model

- Performance validated by model testing



Integrated Undersea Warfare (IUSW)

- At-sea mine avoidance testing complete
- Automation testing complete



Affordability Considerations

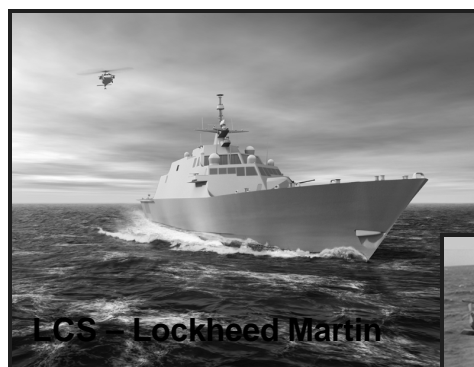


Program Executive Office, Ships

- **CAIV Model**

- Establish affordability targets for end item and permit capability trades to achieve desired unit cost

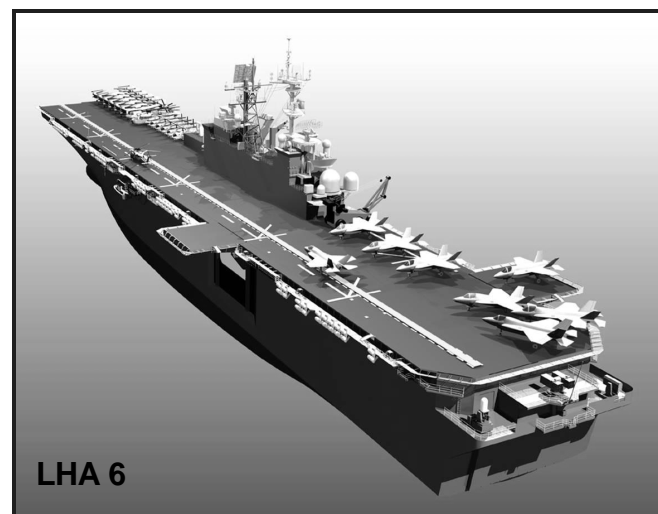
Example: LCS, LHA 6



LCS – Lockheed Martin



LCS – General Dynamics



LHA 6

LCS Today



Program Executive Office, Ships

CAIV Target \$220M Seaframe



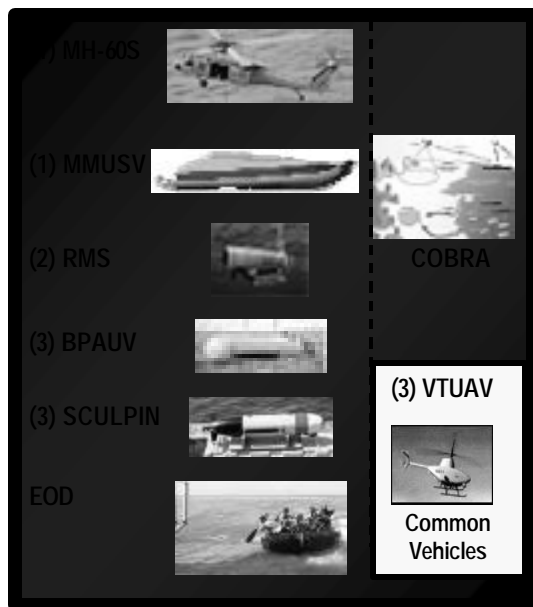
Lockheed Martin

Gibbs & Cox • Marinette Marine • Bollinger Shipyards

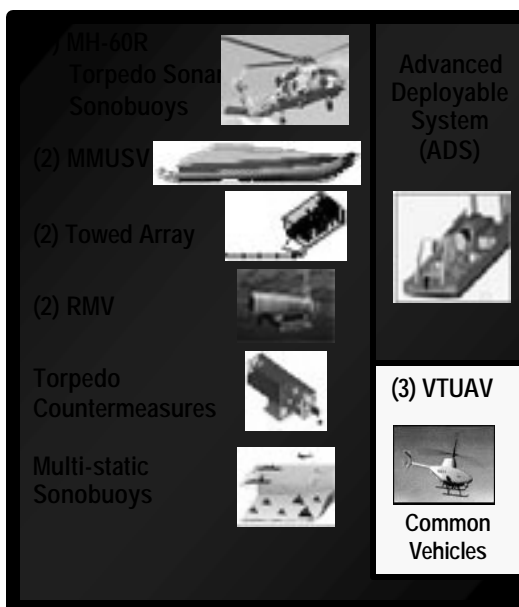


General Dynamics

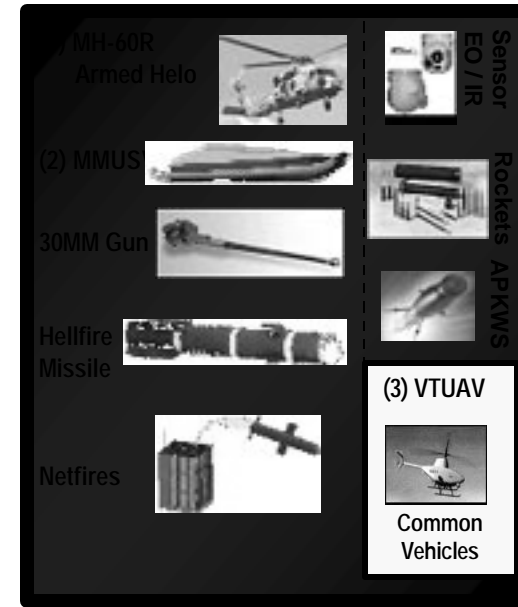
Bath Iron Works • Austal • BAE Systems • CAE • MAPC



MIW Mission Package



ASW Mission Package

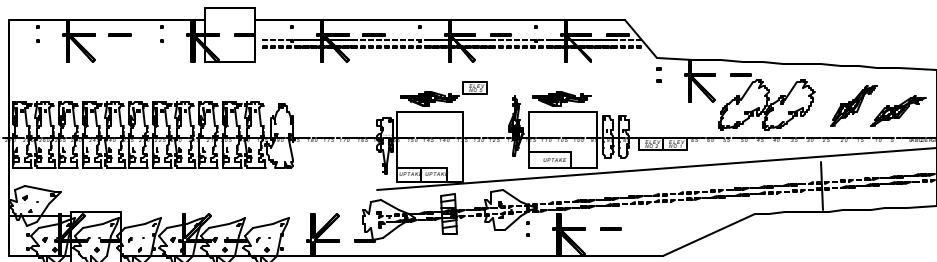


SUW Mission Package

LHA 6 Requirements vs. Cost – Tradeoff history

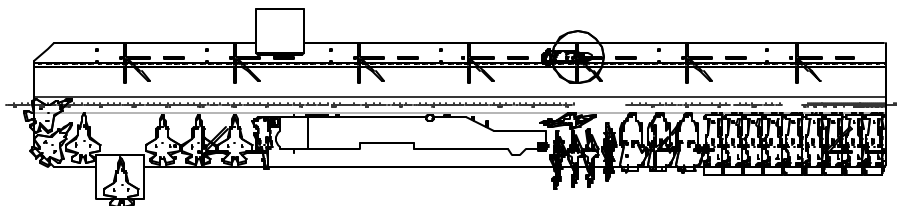


Program Executive Office, Ships



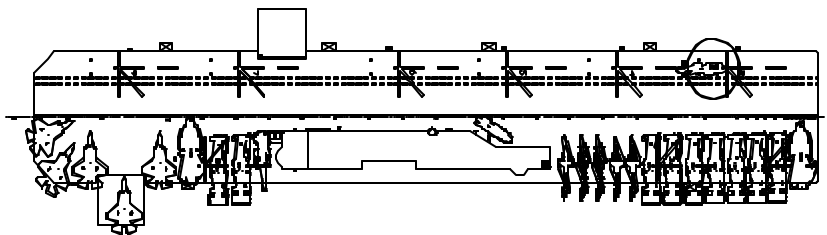
Dual Tram Line

- Displacement – 69,000 Ltons
- Aircraft Capacity
 - 37 aircraft
 - 10 CH-53/MV-22 operational spots
 - Concurrent flight operations
- Cost - \$5.1B (ROM) for an FY10 ship



LHA(R) Plug Plus

- Displacement – 50,000 Ltons
- Aircraft Capacity
 - 33 aircraft
 - 10 CH-53/MV-22 operational spots
 - Limited concurrent flight operations
- Cost - \$3,780M for an FY07 ship



LHA 6

- Displacement – 45,000 Ltons
- Aircraft Capacity
 - 31 aircraft
 - 9 CH-53/MV-22 operational spots
 - Limited concurrent flight operations
- Cost - \$2,762M for an FY07 ship



- **Requirements Model**

- In lieu of asking for multi-mission platforms to solve all requirements needs, establish focused mission needs and permit mission swap out by facilitating common interfaces

Example: LCS

- In the definition of requirements, establish realistic threshold to objective KPPs and resource (execute to the threshold level)

Examples: DDG 1000, LCS, MPF(F), LHA 6



- **Designing for Producibility Model**

- Insertion of common interfaces in design

Example: DDG 1000, LCS

- Maximize reconfigurable internal volume

Example: LCS

- Maximum reuse of existing production infrastructure and existing designs to achieve new requirements

Example: MPF(F) Squadron

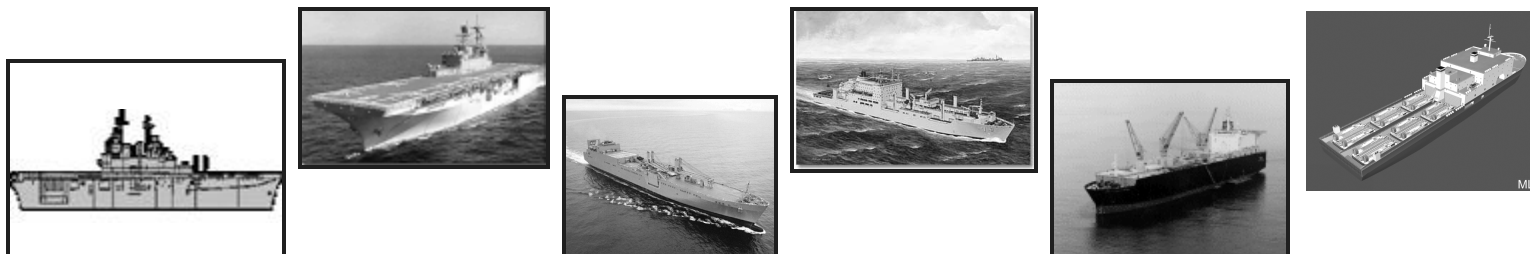
Example: DDG 1000 hull to CG(X) hull

MPF(F) Decision – Hybrid Legacy Option



Program Executive Office, Ships

- Meets the basic requirements – preferred option by USMC/USN leaders
- Flexible mix of ships and capabilities, transition opportunities
 - Provides opportunities for Joint applications
- MPF(F) Squadron selected has both low cost and schedule risk overall;
 - One new design – fits with industrial base capacity
 - Two hot production lines
 - Program benefits from non recurring engineering already accomplished and learning curve (LHA(R) and T-AKE)
 - Return costs available
 - Three existing designs (LHD, T-AKE and LMSR)
 - Mitigates cost for non recurring engineering
 - Return costs available
 - Minimizes workload disruption in shipyards



MPF(F) Squadron



Program Executive Office, Ships

LHA(R) w/MEB C2



2

- Lightship Displacement: 30,862 MT
- Landing Spots: 9/ship
- Personnel: 3000/ship
- Ship Speed: 22 kts

LHD w Aviation C2



1

- Lightship Displacement: 28,540 MT
- Landing Spots: 9/ship
- Personnel: 3000/ship
- Ship Speed: 22 kts

LMSR



3

- Lightship Displacement: 36,289 MT
- Landing Spots: 2/ship
- Personnel: 345/ship (+500 surge)
- Ship Speed 24 kts

T-AKE



3

- Lightship Displacement: 25,700 MT
- Landing Spots: 2/ship
- Personnel: 194/ship
- Ship Speed 20 kts

Legacy Dense Pack



2

- Lightship Displacement: 19,900 MT
- Landing Spots: 1/ship
- Personnel: 62/ship
- Ship Speed 18 kts

• Squadron is 14 ships

• 6 hulls: 2 hot production lines, 1 new design

• Full MEB (1 vertical battalion and 2 surface battalions) are selectively offloadable

– Personnel for second surface battalion are on Sea Base

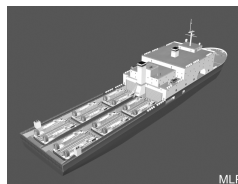
• 11 of 14 ships built to commercial survivability standards (minor enhancements), 3 ships to military survivability standards

• MLP required for surface interface

• Meets delivery timeline for vertical and surface battalions

• Significant Industrial Base stability

MLP(w/Troops)



3

- Light Ship Displacement: 28,423 MT
- Landing Spots: VERTREP
- Personnel: 1300/ship
- Ship Speed 20 kts

Affordability Considerations



Program Executive Office, Ships

- **Designing for Lifecycle Optimization Model**

- Modernization through mission module upgrades

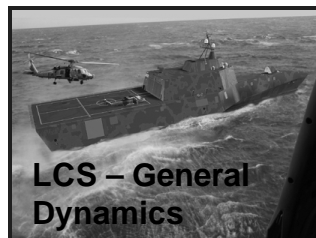
Example: LCS

- Increased reliance on automation, HSI to remove touch labor in maintenance, supply support, watchstanding

Example: DDG 1000, LCS, LPD 17, LHA 6



LCS – Lockheed
Martin



LCS – General
Dynamics



DDG 1000 ZUMWALT



LHA 6



LPD 17 USS SAN ANTONIO

Affordability Considerations



Program Executive Office, Ships

- **Increased partnering across the national and international spectrum model**
 - **Common requirements across services**
 - Example: Joint High Speed Vessel (Army, Navy, USMC)
 - Example: MPF(F) Seabasing
 - Example: Potential LCS and USCG Deepwater
 - **International cooperation**
 - Example: LCS FMS cases

Summary



Program Executive Office, Ships

- **CNO's Guidance:**
 - Sustain Fleet size via stable SCN funding
 - Buy the right capability at the right cost
- **Building the Fleet of the Future**
 - DDG 1000 *ZUMWALT* class
 - LCS 1 *FREEDOM* class
 - LPD 17 *SAN ANTONIO* class
 - LHA 6 class
 - T-AKE 1 *LEWIS AND CLARK* class
- **A stable shipbuilding plan, coupled with one or more affordability strategies, plus a focused industry push for cost reduction yields affordable platforms**

"We need to stop getting smaller... My biggest challenge is to build a fleet for the future... The goal is to have a plan which is stable and industry can build to."

*- Admiral Mike Mullen, CNO
7 February 2006*



Questions?

Back Up



Program Executive Office, Ships

Program Capability and Status



Program Executive Office, Ships

- **DDG 1000 ZUMWALT**
- **LCS 1 FREEDOM**
- **LPD 17 SAN ANTONIO**
- **LHA 6**
- **MPF(F)**
- **T-AKE 1 LEWIS AND CLARK**

DDG 1000 ZUMWALT Class



Program Executive Office, Ships



DDG 1000 Physical Design



Program Executive Office, Ships

Characteristics

Length	600 ft	Displacement	14,564 LT
Beam	80.7 ft	Installed Power	78 MW
Draft	27.6 ft	Crew Size	142
Speed	30 kt	(incl. Aviation detachment)	

Sensors

Dual Band Radar

- S-Band VSR
- X-Band MFR

HF & MF Bow Sonar Arrays

Multi-Function Towed Array

EO/IR System

ES System

Superstructure
Composite structure

Weapons

(80) Advanced vertical launch cells for
Tomahawk, ESSM, Standard
Missile

(2) AGS 155 mm guns
(600) 155 mm rounds
(2) 57 mm Close In Guns

Torpedo Defense (Space Reservation)

Anti-Terrorism (Space Reservation)

Aviation

MH60R and (3) VTUAVs
(Capacity for 2 MH 60Rs)

Integrated Power System

(2) Main Turbine Generators (MTG)

(2) Auxiliary Turbine Generators (ATG)

(2) 34.6 MW Advanced Induction Motors

Integrated Fight Through Power

Boats

(2) 7m RHIBs
(sized for (2) 11m RHIBs)

Hull

Wave-piercing tumblehome

DDG 1000 Critical Technologies



Program Executive Office, Ships

Infrared Mockups (IR)

- Land-based suppressor testing complete
- At-sea panel testing complete



Integrated Composite Deckhouse & Apertures (IDHA)

- RCS testing complete
- Co-site testing complete



Dual Band Radar (DBR)

- MFR land-based testing complete
- VSR final array assembly complete



Advanced Gun System (AGS)

- Initial guided flight testing complete
- Land-based testing complete



Peripheral Vertical Launch System (PVLS) / Advanced VLS

- Two detonation tests conducted
- Missile restrained firing testing complete



Integrated Power System (IPS)

- Component factory testing complete
- Critical Test Parameters (CTPs) complete



Autonomic Fire Suppression System (AFSS)

- At-sea weapons effect and autonomic fire suppression testing demonstrated



Total Ship Computing Environment (TSCE)

- Software Releases 1, 2, and 3 successfully coded, tested, and authorized by the Government



Hull Form Scale Model

- Performance validated by model testing
- UNDEX testing



Integrated Undersea Warfare (IUSW)

- At-sea mine avoidance testing complete
- Automation testing complete

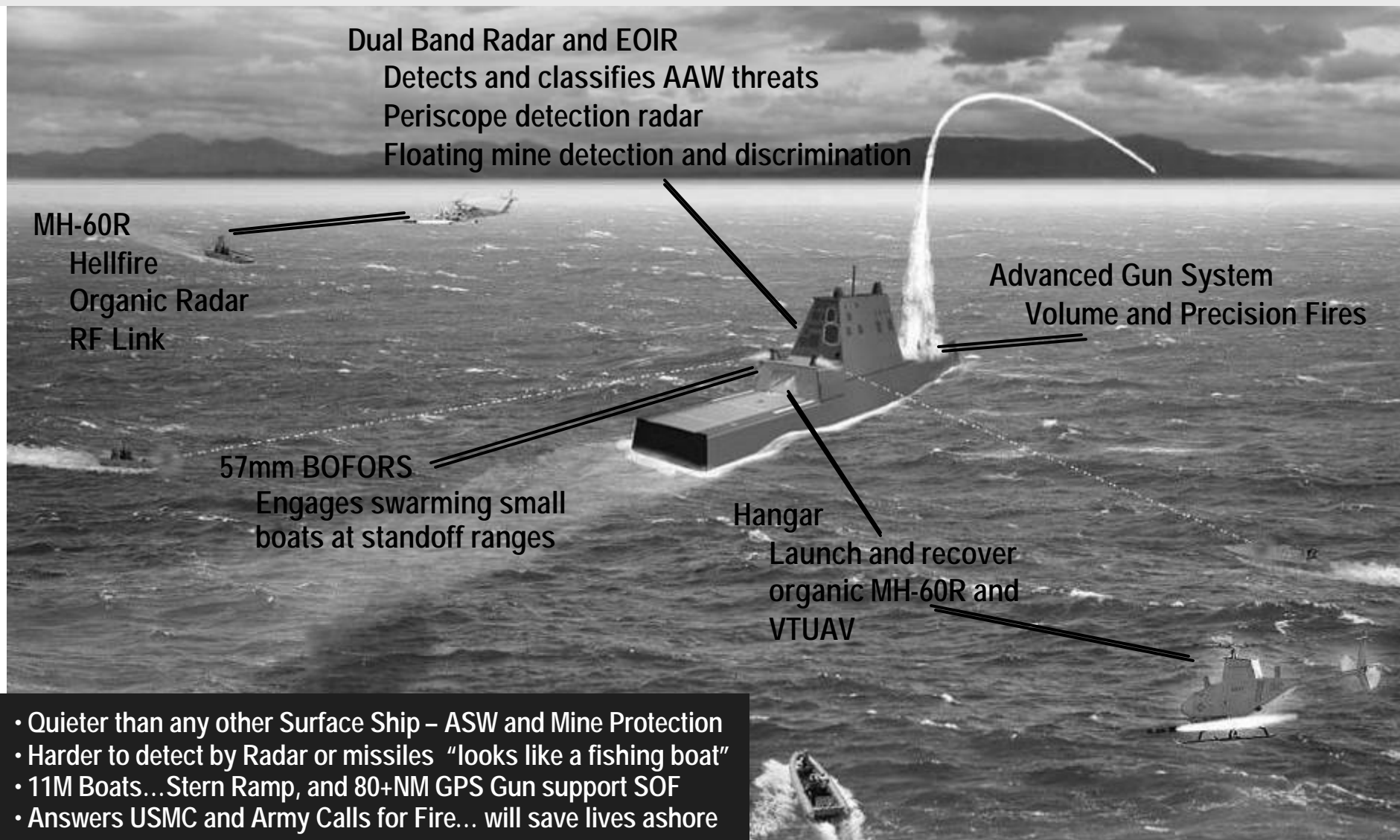


DDG 1000: Built to Dominate the Littoral



Program Executive Office, Ships

Persistent Surveillance, Tracking, and Rapid Engagement



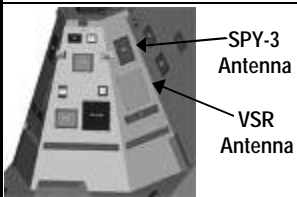
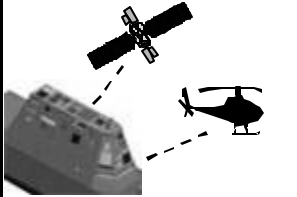




- Quieter than any other Surface Ship – ASW and Mine Protection
- Harder to detect by Radar or missiles “looks like a fishing boat”
- 11M Boats...Stern Ramp, and 80+NM GPS Gun support SOF
- Answers USMC and Army Calls for Fire... will save lives ashore

DDG 1000 Capability Improvements



Program Executive Office, Ships

	Requirement	Technology	Capability Improvement
	Persistent presence in the littorals, survivability	Hull Form and Structures	Reduced signatures and vulnerability
	Improved acoustic signature, reduced O&S costs, 30 kt sustained speed, survivability	Integrated Power System	Signatures, fuel efficiency, power continuity and quality, future growth
	Cruise missile and small boat defense, periscope and floating mine detection in littorals	Dual Band Radar	Firm track range against stealthy targets in clutter environment
	Interoperability, low Radar Cross Section (RCS), optimal manning, reach-back	Command, Control and Communications	Fully integrated Command & Control, increased bandwidth, enables FORCENet, Open Architecture based
	Increased rate of fire, improved lethality, and reduced manned	Advanced Gun System	Increased Fire Support Coverage
	Precision strike and volume fires	Long Range Land Attack Projectile	GPS Accuracy 155mm sized warhead

DDG 1000 Program Status



Program Executive Office, Ships

- Phase III design and development contract (FY02 - FY05) closing out – radar efforts remain to complete (VSR, Wallops construction)
- Critical Design Review (CDR) completed 14 Sep 05
 - Demonstrated DD(X) is ready to proceed with detail design
 - EDMs and other activities sufficiently mitigated technical risk
- Phase IV transition design contracts awarded
- Milestone B Approved 23 Nov 05
 - Authorized entry into System Development and Demonstration (SDD) Phase
 - Approved LRIP of 8 ships (7 ships in CNO 313 plan)
 - Approved Milestone C exit criteria
 - Approved construction award DAB entrance criteria
 - Approved DD(X) Acquisition Program Baseline (APB)
 - Approved DD(X) Acquisition Strategy Report (ASR) and Dual Lead Ship Strategy
 - Directed Navy return to DAB prior to exercise of 2 lead ship construction options
- Designated DDG 1000 ZUMWALT Class 07 Apr 06
- Detail Design contracts awarded in Aug 06 to NGSS and BIW
- Construction contracts to be awarded Dec 06 to NGSS and BIW

LCS 1 FREEDOM Class



Program Executive Office, Ships



INDEPENDENCE (LCS 2)

**General Dynamics
Bath Iron Works
Austal USA
BAE Systems**

FREEDOM (LCS 1)

**Lockheed Martin
Gibbs & Cox
Marinette Marine
Bollinger Shipyards**

FREEDOM (LCS 1): Semi-Planing Monohull



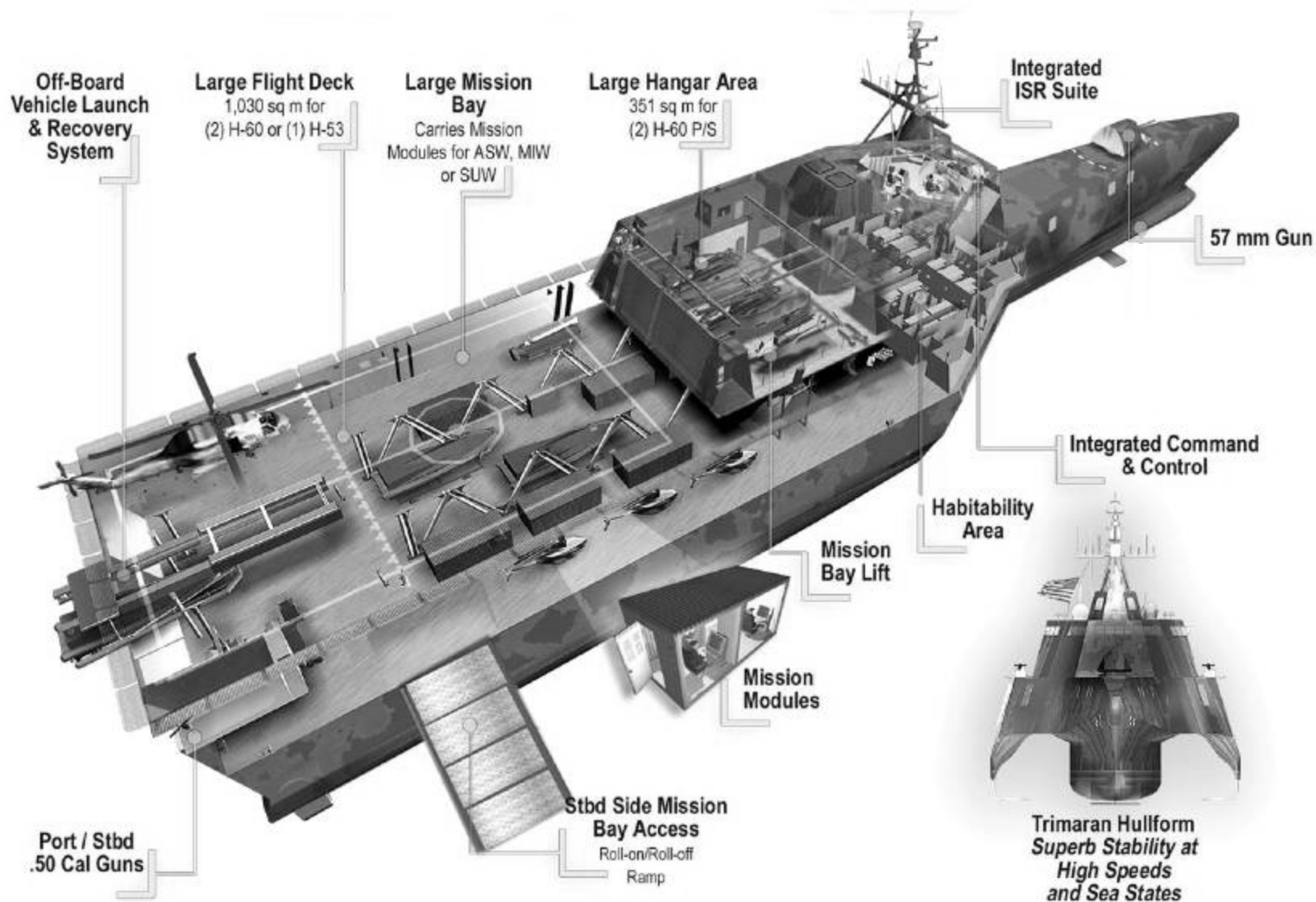
Program Executive Office, Ships



INDEPENDENCE (LCS 2): Trimaran Hull



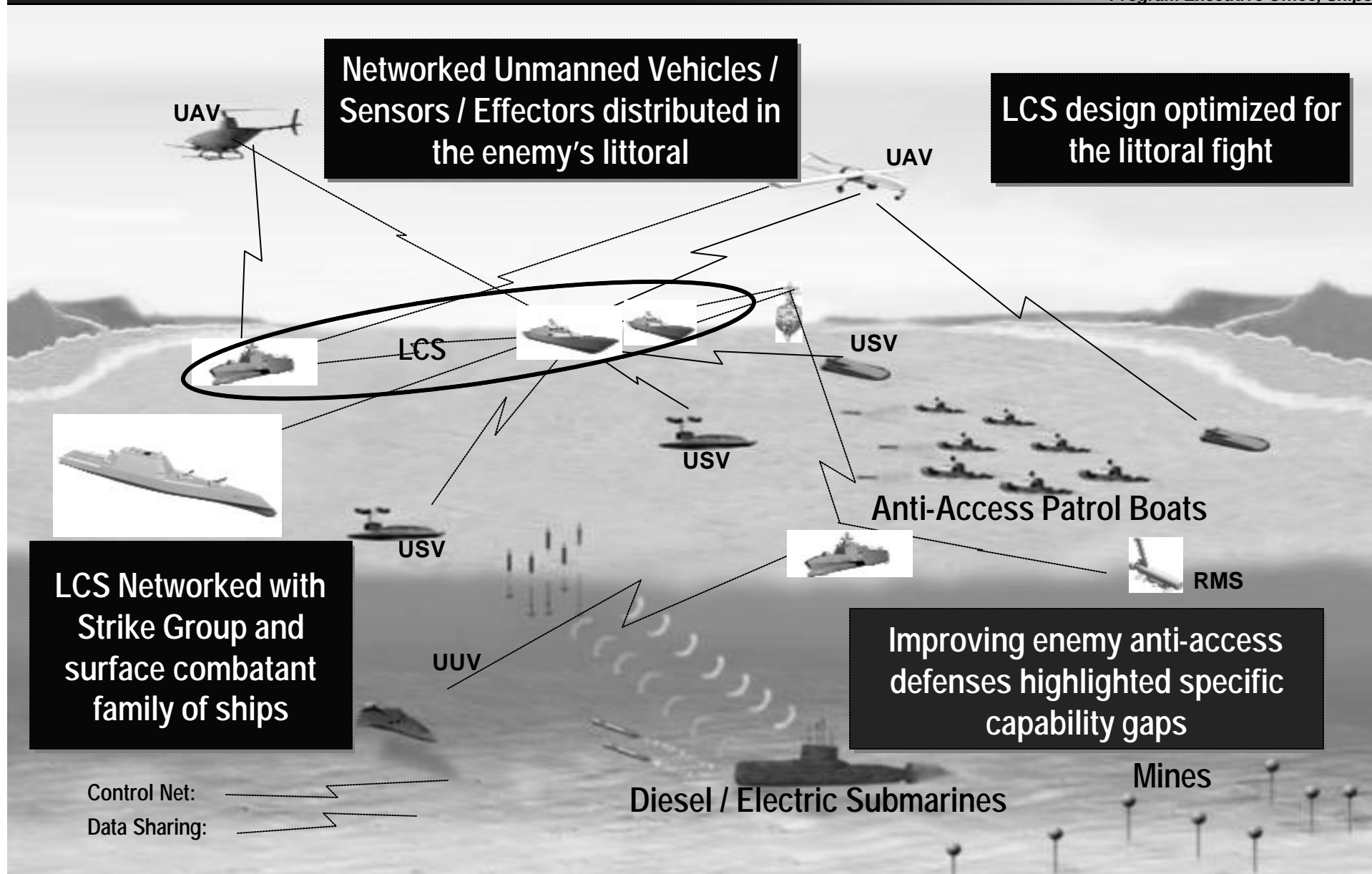
Program Executive Office, Ships



LCS Concept of Operations



Program Executive Office, Ships



LCS Mission Package Development



Program Executive Office, Ships

- **Mission Package Computing Environment**
 - MPDL connectivity demonstrated between NSWC PC and LM/GD facilities – Oct 2005
 - MIW Software build 0.2 delivered and testing completed – May 2006
 - MIW Software build 1.0 delivered and testing in progress – Sep 2006
- **Mine Warfare Mission Package**
 - First Mine Warfare Mission Package Support Modules Delivered to NSWC PC
 - Three support modules outfitted
 - AQS-20A
 - AMNS / ALMDS / AMNS
 - RMS
 - RMS cradle FAT and 200% load test
- **Anti-Submarine Warfare Mission Package**
 - Sea Talon ACTD transitioned to POR
 - USV Based Bi-Static sonar operations demonstrated in SOCAL
 - MS OBS (Active Source)
 - UTAS (Passive Array)
- **Surface Warfare Mission Package**
 - NLOS-LS
 - Successful PAM Seeker Captive flight test
 - Successful BTV launch from motion simulator (Sea State 3)
 - MK-46 Mod 01 30MM gun Structural Test Firing



- **Mission Package Integrator contract awarded – Jan 2006**
- **LCS Interface Control Document (ICD) Complete**
- **4 mission Package Crews onboard and training**
 - MIW Blue & Gold
 - ASW Blue & Gold

FREEDOM (LCS 1) Christening – 23 Sept 06



Program Executive Office, Ships



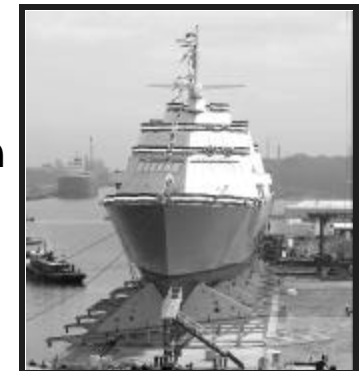
LCS Program Status



Program Executive Office, Ships

- ✍ 23 Feb 02 ASN(RDA) directed establishment of LCS Program
- ✍ 08 Jul 02 N76 letter: initiates exploratory studies for Family of Ships concept
- ✍ 14 Aug 02 RFP released for Ship Concept Studies
- ✍ 17 Sep 02 LCS Program Office Established (under PEO(S))
- ✍ 08 Nov 02 Contract award for Family of Ships Concept Studies (FMHSS)
- ✍ 02 Dec 02 Defense Authorization Act (Public Law 107-314) provided Congressional New Start authorization for the Littoral Combat Ship
- ✍ 28 Feb 03 Solicitation for LCS Flight 0 Preliminary Designs
- ✍ 17 Jul 03 Preliminary Design Contracts (3) Awarded
- ✍ 27 May 04 DAB: Milestone A / Program Initiation
- ✍ 28 May 04 Down select to two for final design
- ✍ 15 Dec 04 Exercised 1st Detail Design & Construction option
- ✍ 02 Jun 05 Lay Keel for USS FREEDOM (LCS 1)
- ✍ 14 Oct 05 Exercised 2nd Detail Design & Construction option
- ✍ 19 Jan 06 Lay Keel for USS INDEPENDENCE (LCS 2)
- ✍ 26 Jun 06 Exercised construction option for third ship
- ✍ 23 Sep 06 Launch USS FREEDOM (LCS 1)

4
years



LPD 17 SAN ANTONIO Class



Program Executive Office, Ships



LPD 17 SAN ANTONIO Class Capability



Program Executive Office, Ships

- Functionally replace LPD 4, LSD 36, LKA 113, and LST 1179 Ship classes

- Provide Increased
- Lift
- Survivability
- Mission Flexibility
- Service Life
- Improved Quality of Life
- Reduced Total Ownership Cost



Ship Characteristics

Displacement	24,900 lt
Speed	22 + kts
Length	684 ft
Beam	105 ft
Draft	23.0 ft
Crew	360 Sailors / 3 Marines
Troop Lift	699 Marines (800 surge)
Med Capability	2 Med / 2 Dental Operating Rooms

Key Performance Parameters

Lift	Threshold	Objective
Troops	650	750
Vehicle Sq Ft	22K	25K
Cargo Cubic Ft	22K	25K 34K
LCAC Spots	1 (+1)	2
VTOL Spots (CH-46/53/MV-22)	4/2/2	4/3/2

◆ = PM Current Estimate

LPD 17 Class Construction Status



Program Executive Office, Ships

NEW ORLEANS (LPD 18)

94% Complete



MESA VERDE (LPD 19)

89% Complete



Approved for Public Release
19-041120-Float OR-0004

GREEN BAY (LPD 20)

72% Complete



LPD 17 Class Construction Status (cont'd)



Program Executive Office, Ships

NEW YORK (LPD 21)

51% Complete



SAN DIEGO (LPD 22)



ANCHORAGE (LPD 23)

Start of Fabrication in 2007

ARLINGTON (LPD 24)

Start of Fabrication in 2007

SOMERSET (LPD 25)

Start of Fabrication in 2008

USS SAN ANTONIO (LPD 17) Status



Program Executive Office, Ships

✍ Christened/Launched	Jul 03
✍ Builders Sea Trial	Apr 05
✍ Acceptance Trial	Jun 05
✍ Delivery	Jul 05
✍ Crew Move Aboard	Aug 05
✍ Sail Away Trial	Nov 05
✍ Sail Away	Dec 05
✍ Commissioned	14 Jan 06
✍ Fitting Out Availability	30 Jan 06 – 30 Mar 06
✍ Post Shakedown Availability	Mar 07

- FOA / PSA contract awarded to BAE SR (Norshipco)



Post Delivery Test & Trials

- | | |
|--|---------------------------------------|
| – First of Class Trials/Certifications | – OPEVAL |
| – Combat System Ship Qualification Testing (CSSQT) | – Total Ship Survivability Test |
| – Developmental Testing (DT) | – LCAC Interface Trials |
| – Crew Basic Phase Training | – Post Shakedown Availability |
| – Final Contract Trial | – Intermediate/Advance Phase Training |

LHA 6 Amphibious Assault Ship



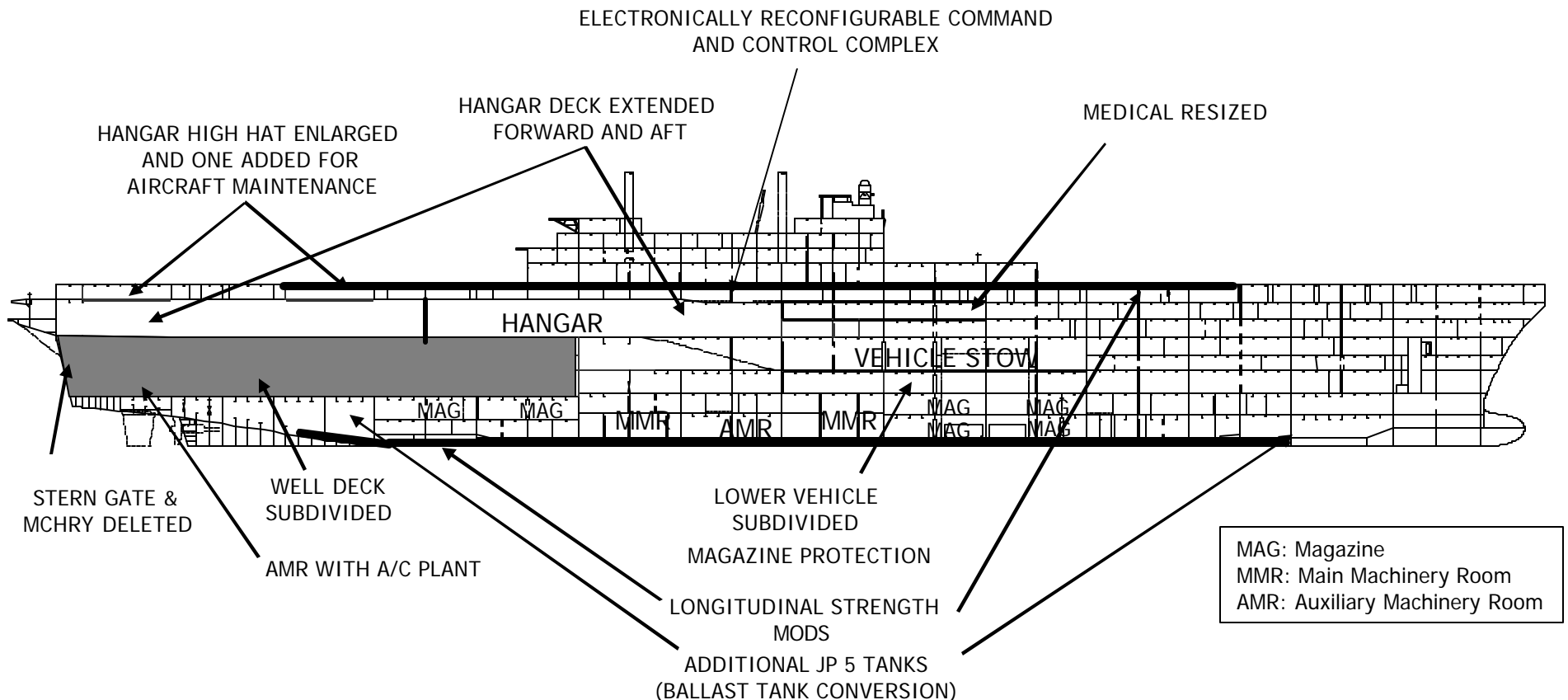
Program Executive Office, Ships



LHA 6 Design: Optimized for Aviation



Program Executive Office, Ships



- Increased aircraft spotting factors for future Marine Corps aircraft as well as larger logistic footprint required hangar deck expansion and subsequent relocation of AVCAL (aviation test equipment, tools, parts etc.) and maintenance shops to the former well deck area
- Removal of well deck allowed for increased aviation fuel capacity through conversion of ballast tanks to JP-5 tanks

Capability Comparison: LHA 1 vs. LHD 1 vs. LHA 6



Program Executive Office, Ships

Requirements	LHA	LHD	LHA 6
Aviation (JSF)	0	19	23
Aviation Maint (MV22)	Limited	Limited	Full (2 MV22)
Cargo (K cubic ft)	109	125	160
Vehicle (K square ft)	25.4	20.9	11.6
Troops	1,713	1,686	1,686
Well Deck (LCAC)	1	3	0
JP-5 (K gallons)	400	617	1,300
Sustained Speed (kts)	22	22	22
Service Life Allowance:			
Disp	None	2.5%	>5%
KG	remains	+0.5 ft	>+1.0 ft
Survivability (armor)	None	Limited	Add'l

CAPABILITY VALIDATED BY JROC ON 8 FEBRUARY 2005

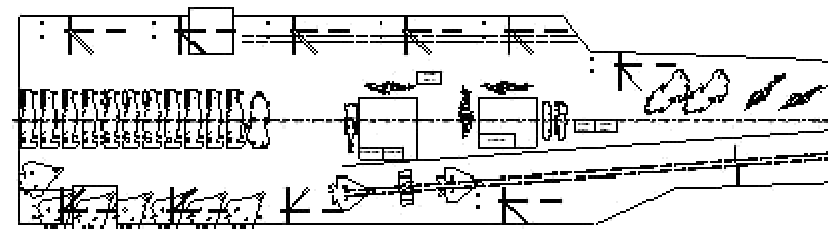
JROCM validated revised aviation, survivability and force protection KPPs on 19 December 2005

LHA 6 Program Status

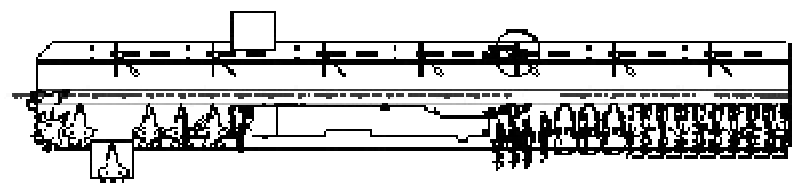


Program Executive Office, Ships

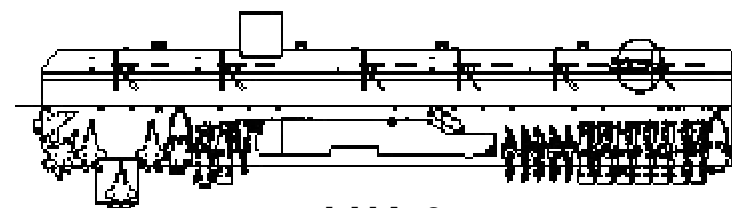
- Replace LHA Class Amphibious Assault Ship
- Milestone A completed Jul 2001
- Program redirected by DoN leadership Capabilities Letter, Apr 2004
- Restructured to “aviation variant”
- Procurement funding for lead ship, FY07 (PB06)
- Received Milestone B approval 11 January 2006
- Construction contract to NGSS anticipated in early FY07



Dual Tram Line
\$5.1B (ROM) for an FY10 ship



LHA(R) Plug Plus
\$3,780M for an FY07 ship



LHA 6
\$2,762M for an FY07 ship

T-AKE 1 LEWIS AND CLARK Class



Program Executive Office, Ships



T-AKE 1 Class Capability



Program Executive Office, Ships

- **Primary Mission: Provide Logistic Lift Capability as a Shuttle Ship from sources of supply for transfer at sea to Station Ships and other Naval Warfare Forces**
 - Ammunition
 - Food
 - Repair parts
 - Expendable supplies and material
 - Limited quantities of fuel
- **Secondary Mission: Operate in concert with a T-AO 187 Class Ship (Fleet Oiler) as a Substitute Station Ship to provide direct Logistics Support to the ships within a Battle Group**
- **Description: Dry Cargo/Ammunition Ship**



T-AKE 1 LEWIS AND CLARK Program Status



Program Executive Office, Ships

- **T-AKE 1 USNS *LEWIS AND CLARK***
 - construction started, Sept 2003
 - Christened 21 May 2005
 - Delivered, Jun 2006
- **T-AKE 2 USNS *SACAGAWEA***
 - Christened, 2006
- **T-AKE 3 USNS *ALAN SHEPARD***
 - Keel Laid, Feb 2006
- **T-AKE 4 USNS *RICHARD E. BYRD***
 - Keel Laid, Aug 2006
- **T-AKE 5 USNS *ROBERT E. PEARY***



DDG 51 Christenings and Commissionings



Program Executive Office, Ships

- **2006 Christenings:**
 - GRIDLEY (DDG 101)
 - SAMPSON (DDG 102)
- **2006 Commissionings:**
 - USS FORREST SHERMAN (DDG 98)
 - USS FARRAGUT (DDG 99)
- **2007 Christenings:**
 - STERETT (DDG 104)
 - TRUXTUN (DDG 103)
 - DEWEY (DDG 105)
- **2007 Commissionings:**
 - USS GRIDLEY (DDG 101)
 - USS SAMPSON (DDG 102)



PMS 325 MPF(F) R&D Program FY06 At-Sea Test



Program Executive Office, Ships



Alongside operations (also called skin-to-skin) permits the USNS Red Cloud to lower the ramp and transfer vehicles to the Dockwise Mighty Servant 3, for further loading onto LCACs. This simulates the assembly and offload of up to 1/3 of a surface Battalion Landing Team.

MPF(F): Enabling Sea Based Operations



Program Executive Office, Ships

- **MPF(F) Squadron Composition**
- **PMS 325 MPF(F) R&D Program FY06 At-Sea Test**
 - **Arrival and Assembly Tests**
 - **Amphibious Assault Vehicle (AAV) Testing**
 - **Mooring and Vehicle Transfer**
 - **Vehicle Selective Offload**
 - **Omni-Directional Vehicles**
 - **Transfer Unit and Storage Rack**
 - **LCAC Operations**
 - **Pallet and JMIC ASRS**
 - **Multi-Directional Material Handling System**
 - **Displacement Craft Interface**

MPF(F) Squadron



Program Executive Office, Ships

LHA(R) w/MEB C2



2

- Lightship Displacement: 30,862 MT
- Landing Spots: 9/ship
- Personnel: 3000/ship
- Ship Speed: 22 kts

LHD w Aviation C2



1

- Lightship Displacement: 28,540 MT
- Landing Spots: 9/ship
- Personnel: 3000/ship
- Ship Speed: 22 kts

LMSR



3

- Lightship Displacement: 36,289 MT
- Landing Spots: 2/ship
- Personnel: 345/ship (+500 surge)
- Ship Speed 24 kts

T-AKE



3

- Lightship Displacement: 25,700 MT
- Landing Spots: 2/ship
- Personnel: 194/ship
- Ship Speed 20 kts

Legacy Dense Pack



2

- Lightship Displacement: 19,900 MT
- Landing Spots: 1/ship
- Personnel: 62/ship
- Ship Speed 18 kts

• Squadron is 14 ships

• 6 hulls: 2 hot production lines, 1 new design

• Full MEB (1 vertical battalion and 2 surface battalions) are selectively offloadable

– Personnel for second surface battalion are on Sea Base

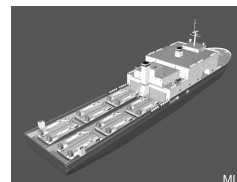
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MLP(w/Troops)



3

- Light Ship Displacement: 28,423 MT
- Landing Spots: VERTREP
- Personnel: 1300/ship
- Ship Speed 20 kts

Arrival and Assembly Tests



Program Executive Office, Ships

Prepositioned vehicles are assembled as part of the MPF(F) mission. Timing data was collected to support discrete event modeling of assembly area operations. These simulations will be used to support LMSR assembly space sizing, arrangement and procedure development efforts.



Vehicles park in assembly bays and forklifts pick up pallets at the ready service/elevator area.



Pallets are moved to the assembly bays by following a one way traffic circle. Returning forklifts wait until needed. All movements are controlled by traffic directors.



Food, water, ammo and fuel for a vehicle is loaded by hand from a pre-mixed pallet.



Pallets are placed in vehicles from one side or from the rear while keeping traffic lanes to other bays clear.

Vehicles depart assembly area.



Amphibious Assault Vehicle (AAV) transits to bay where Marines with packs load in the stern door.

Oxy-acetylene tanks are loaded into the AAV Recovery variant.



Amphibious Assault Vehicle (AAV) Testing



Program Executive Office, Ships



AAV swim
onto
Mighty
Servant 3



AAV
launch
from
Mighty
Servant 3



AAV arrive on LCAC



AAV lifted by crane onto the Red Cloud



Simulating disabled AAV recovery by ship's winch line

Mooring and Vehicle Transfer



Program Executive Office, Ships



Red Cloud and Mighty Servant 3 approach and moor skin-to-skin at 4 kts.



The side port platform is deployed and ..



the ramp is lifted along the guideposts and deployed to the deck of the Mighty Servant 3.



The center wall gate is opened and vehicles cycle through the LCAC lanes returning to the MS 3.



The ramp is retrieved against the guideposts and stowed.



Vehicle Selective Offload



Program Executive Office, Ships



MTVR Handling

Vehicle maneuvering tests were conducted at pier, anchor and underway with AIR SKIDS and GOJACKS. This capability would improve stow procedures and selective offload capability.



HMMWV on GOJACKS



HMMWV indexing test



20 Foot Container Movement



Single and Double Air Skids



Omni-Directional Vehicles



Program Executive Office, Ships



Sidewinder, Airtrax Inc.



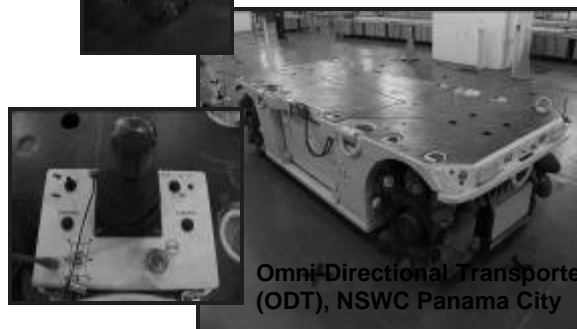
Compact Agile Material Mover (Camm), Oak Ridge National Lab, Operated by NSWC Philadelphia



Hybrid Omni-wheeled Shipboard Sideloader (HOSS), NSWC Panama City



BEC Transport Unit (both an ODV and part of pallet stowage system), Benedict Engineering Co.



Omni-Directional Transporter (ODT), NSWC Panama City

Various Omni-Directional Vehicles (ODV) demonstrated their ability to function in a shipboard environment. Their different stages of development and intended purpose does not allow a head to head comparison. All demonstrated the maneuverability that is an “omni” characteristic that provides easy cargo manipulation to enable dense packing and selective offload of cargo.

Transfer Unit and Storage Rack

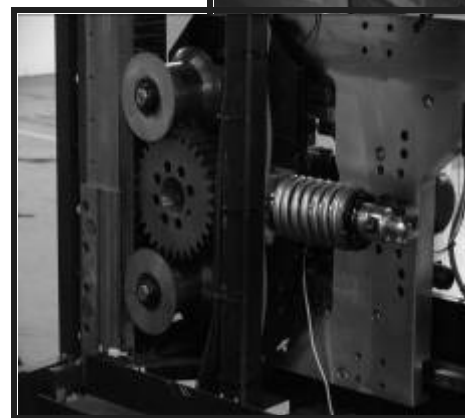
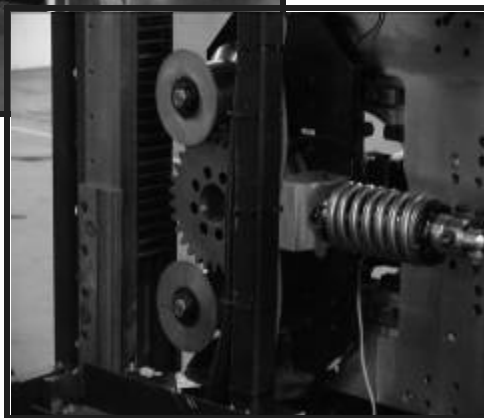
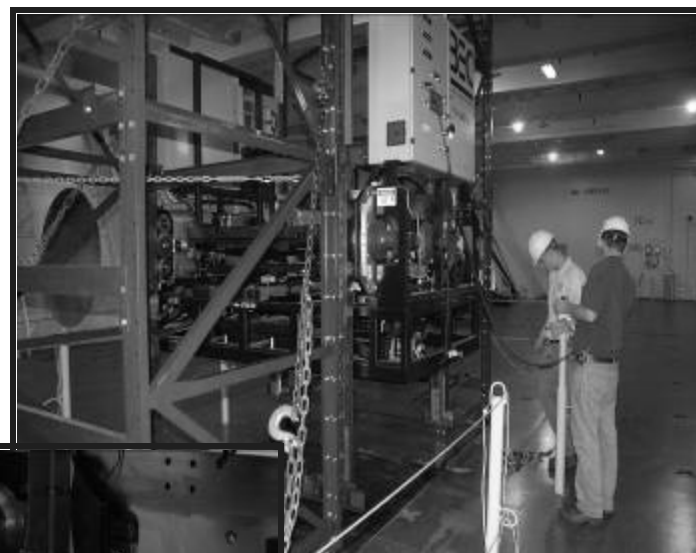


Program Executive Office, Ships



**Transfer Unit enters
shaft in pallet
storage rack...**

**... aligns and
engages the
climbing system...**



**... and climbs up the
shaft to store pallet in
the rack.**

The Benedict Engineering pallet stowage demonstrator consists of a Transfer Unit and a unique stowage rack with a vertical shaft. The Transfer Unit can climb the shaft and deposit a pallet in the rack or conceptually, climb a shaft between decks and drive out of the shaft to a different delivery point.

LCAC Operations



Program Executive Office, Ships

LCAC landing on the Mighty Servant 3



Alternate side wall configuration testing



Damaged LCAC recovery test

Night operations:
LCAC landing, vehicles backing on, vehicles
being lashed down, and LCAC departing

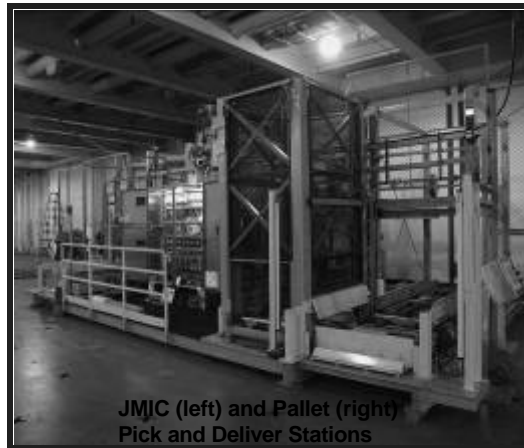


LCAC operations were conducted in a variety of sea states, ship headings, ship speeds and an alternate side wall configuration. This information will support the MLP design and operational procedures. LCAC night operations were conducted including vehicle transfer to support the MPF(F) goal of movement of vehicles to the shore in a period of darkness. The feasibility of damaged LCAC recovery was also demonstrated.

Pallet and JMIC ASRS



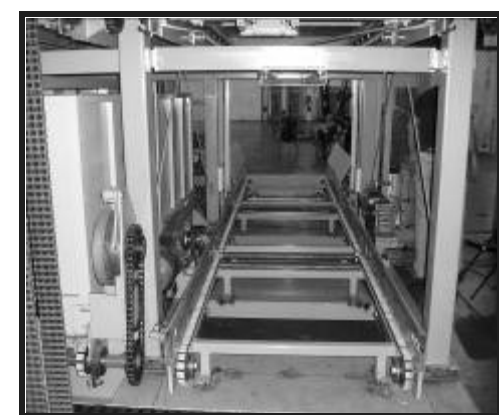
Program Executive Office, Ships



JMIC (left) and Pallet (right)
Pick and Deliver Stations



Storage Racks and Storage/Retrieval Machine



The ATI/General Dynamics/Siemens Shipboard Automated Stowage and Retrieval System (ASRS) demonstrates the feasibility of modifying a warehouse ASRS design to enable it to function at sea. This ONR funded prototype handles fully loaded pallets and JMIC boxes. It is designed to operate safely through sea state 5 .

Multi-Directional Material Handling System



Program Executive Office, Ships



Standard spreader bar is connected to a container within the cell guides,



container is hoisted up to the Transfer Unit,



and Transfer Unit moves the container to any location in the grid.

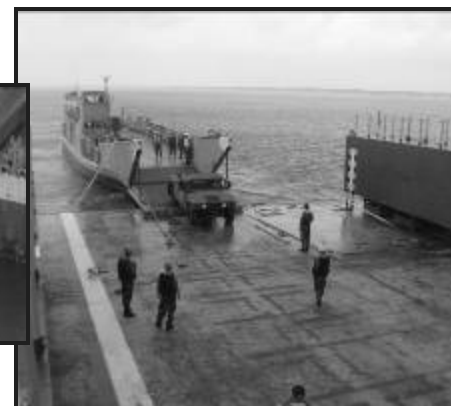
The Benedict Engineering MDMHS was tested pierside, at anchor and underway to demonstrate the feasibility of a shipboard selective stowage and retrieval capability for 20 foot ISO shipping containers (funded by MSC/ USTRANSCOM).

Displacement Craft Interface



Program Executive Office, Ships

Displacement landing craft, a Navy LCU 1600 and an Army LCU 2000, are shown mooring to the MLP surrogate, the Mighty Servant 3, for transfer of vehicles. This is a low sea state capability that will be useful in the Sustainment and Reconstitution phases of the MPF(F) mission and for Humanitarian Aid.



Navy ACU 2 LCU-1600 transferring HMMWV



Army 7TH Transportation Group LCU-2000

Headquarters U.S. Air Force

Integrity - Service - Excellence



Air Force Engagement in Expeditionary Warfare

**Brig Gen Kevin Henabray
Mobilization Assistant to AF/A8X
(AF Strategic Planning)**

24 Oct 2006



Air Force Engagement in Expeditionary Warfare

- In today's world. . .
 - Things We Need to Do
 - Places We Need to Be

- The Air Expeditionary Force (AEF)
 - Transformation within DOD
 - Transforming the Air Force
 - How the AEF works

- Enhancing Joint Warfighting – The Air Force Portfolio of Capabilities for Expeditionary Warfare
 - Global Strike
 - Global Mobility
 - Persistent C4ISR
 - Agile Combat Support



What We Need to Do – Plenty of Strategic Guidance . . .



Force Planning Construct





Strategic Guidance Directs Transformation

- **Fight and win “the long war”**
- **Remain a military without peer**
- **Meet traditional, irregular, catastrophic, and disruptive threats**
- **Recapitalize and modernize**
- **Become a smaller, more capable force**
- **Reduce excess infrastructure**

“We’re fighting a global war, a real global war. We’re focusing on developing more expeditionary notions of Airmen and more expeditionary notions of presentation of forces.”

- CSAF, General T. Michael Moseley



Meeting the Requirements



Integrity - Service - Excellence



The Threat Requires an Expeditionary Force

- **The Cold War military was not structured to face the new range of irregular, catastrophic, and asymmetric threats**
 - **Long War on Terrorism**
 - **Counterinsurgencies**
 - **Stability operations**
 - **Diminished protection of geographic distance**
 - **Proliferation of WMD**
 - **Unpredictability of conflict locations**
 - **Reduced access and need for garrison bases**
 - **Urban operations**
- **The joint force must effectively conduct operations across the entire spectrum of conflict – no more “lesser included cases”**





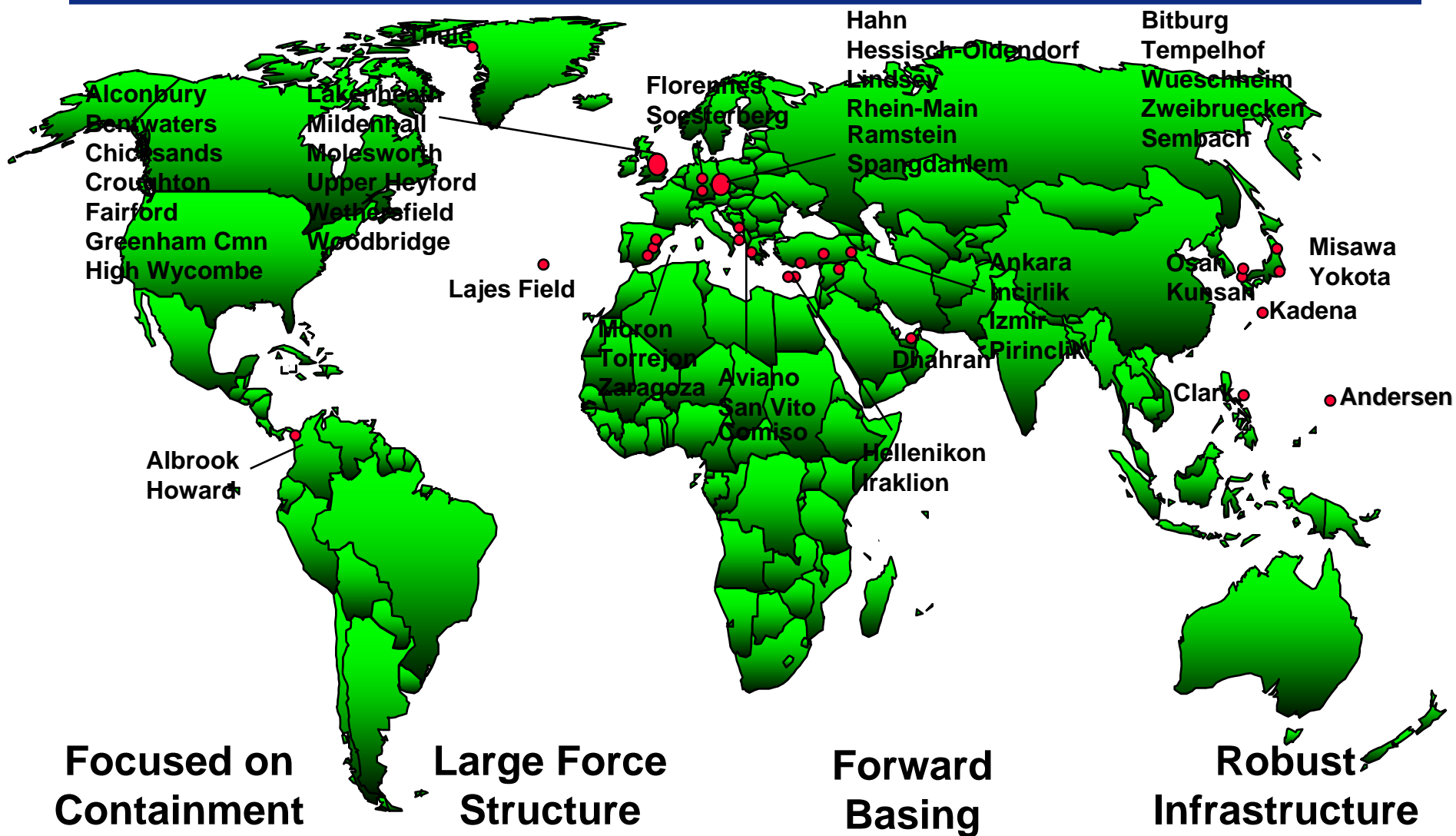
The Air Force “Warfighters” Vision

- **Mission Statement**
 - ***Deliver sovereign options for the defense of the United States of America and its global interests – to fly and fight in Air, Space, and Cyberspace***
- **Priorities**
 - ***Maintain a razor-sharp focus on fighting the Global War on Terror***
 - ***Continue developing our Airmen***
 - ***Recapitalize and modernize our inventory***

Integrity - Service - Excellence



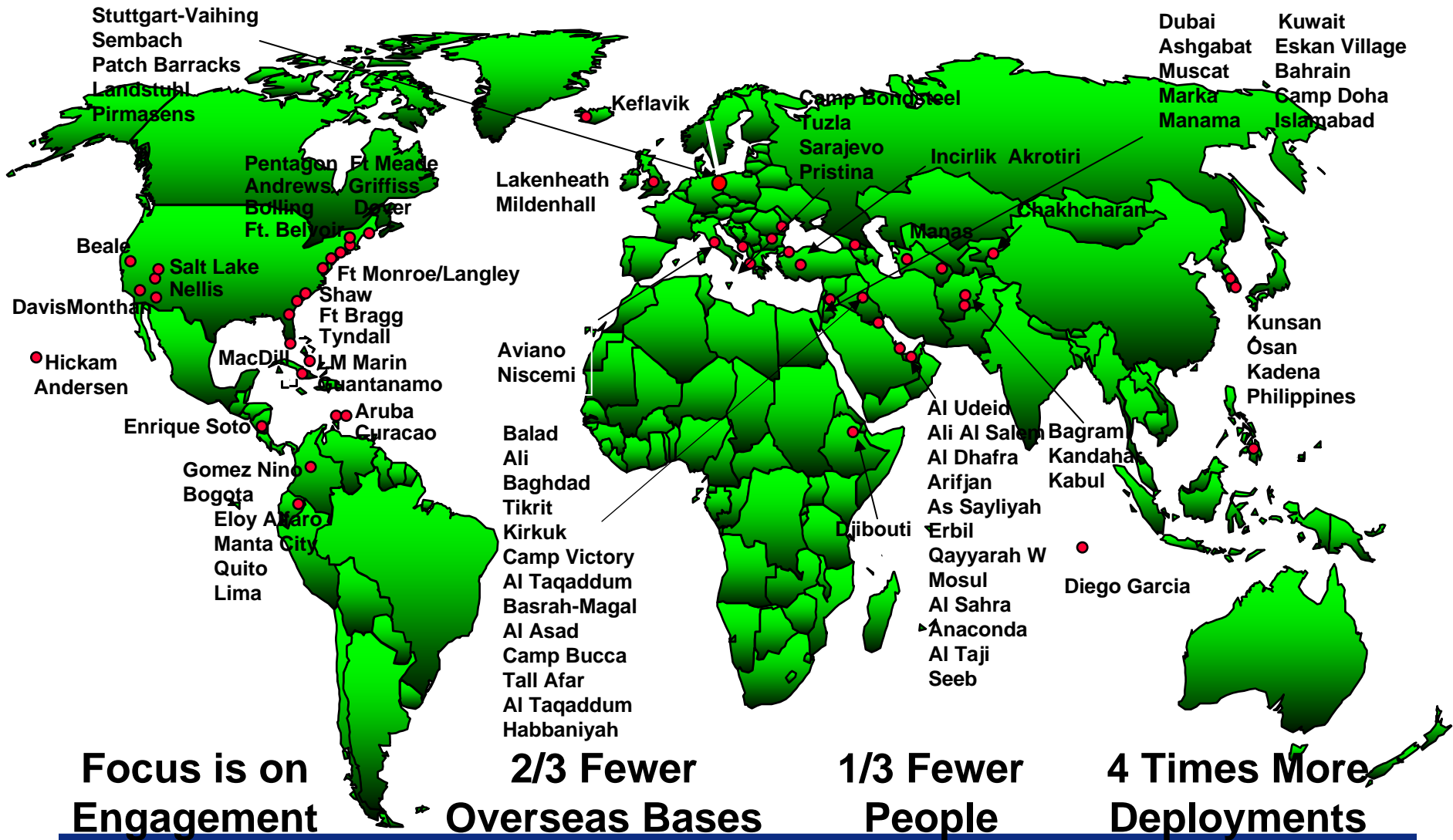
Where We Were – The Cold War Garrison Force



Integrity - Service - Excellence



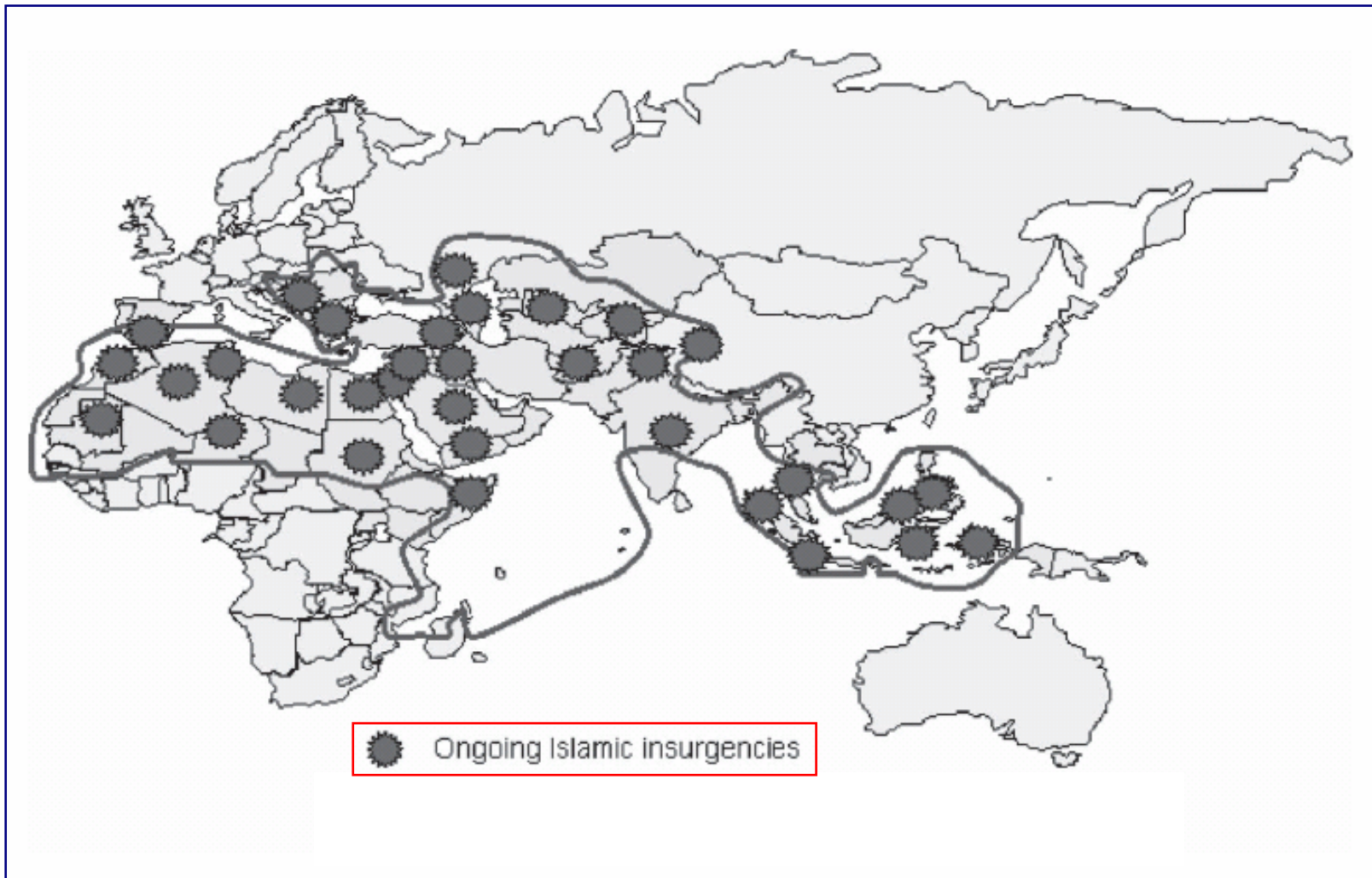
Where We Are Today. . . An Engaged, Expeditionary Force



Integrity - Service - Excellence



Where We Might Be Tomorrow. . . ***“The Arc of Instability”***



*Kilcullen, David J., "Countering Global Insurgency," *Journal of Strategic Studies* (Aug 2005): p. 599 – which cites *Patterns of Global Terrorism 2004* by State Dept as source for data.

Integrity - Service - Excellence

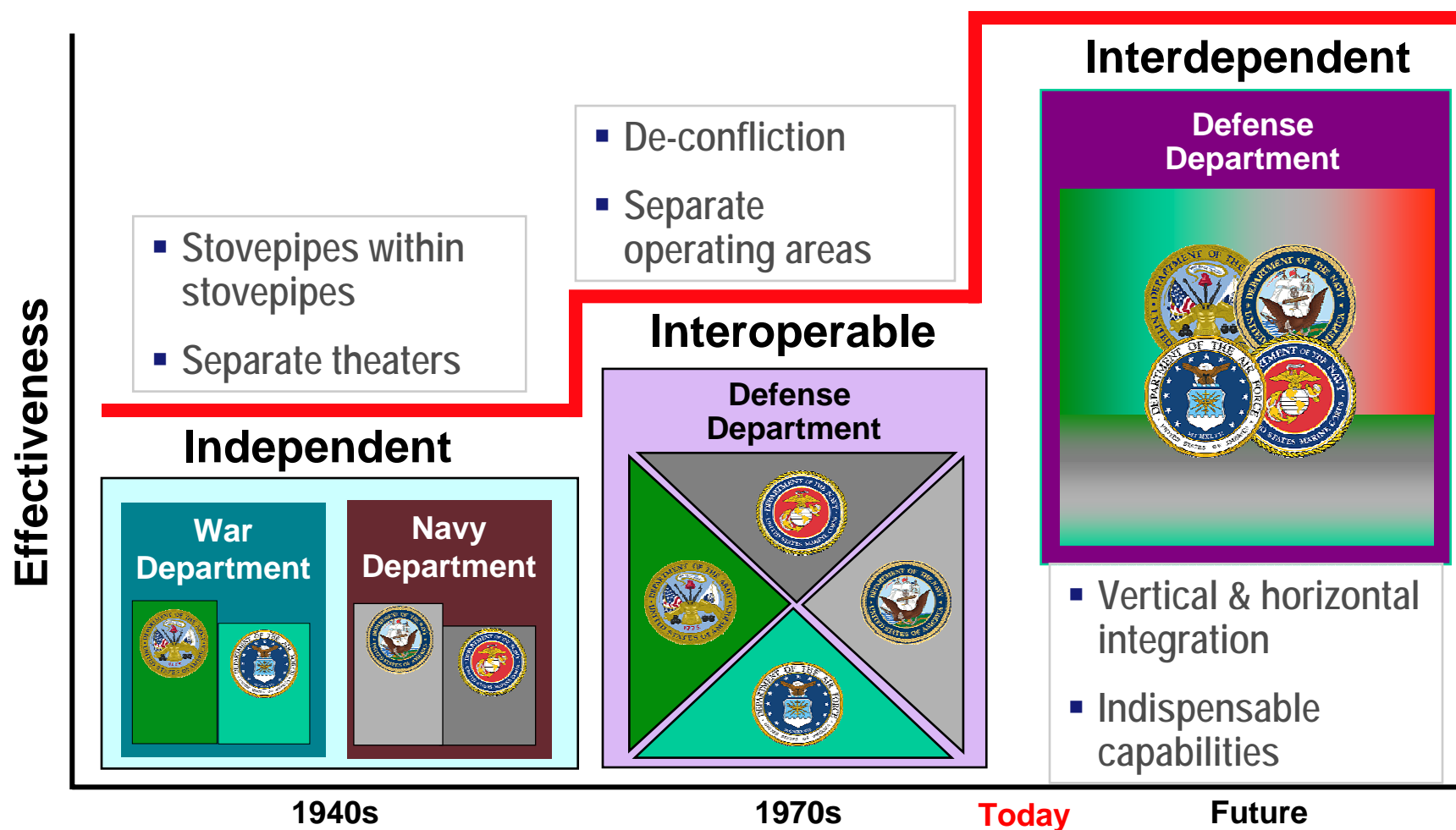


Air Force Engagement in Expeditionary Warfare

- In Today's world . . .
 - Things We Need to Do
 - Places We Need to Be
- **The Air Expeditionary Force (AEF)**
 - Transformation within DOD
 - Transforming the Air Force
 - How the AEF works
- Enhancing Joint Warfighting – Air Force Portfolio of Capabilities for Expeditionary Warfare
 - Global Strike
 - Global Mobility
 - Persistent C4ISR
 - Agile Combat Support



Enhancing Joint Warfighting – Interdependence Requires a Portfolio Approach to Capabilities





Air Force Transformation into an Expeditionary Force



Integrity - Service - Excellence



Enhancing Joint Warfighting – Organize Around Warfighting Headquarters



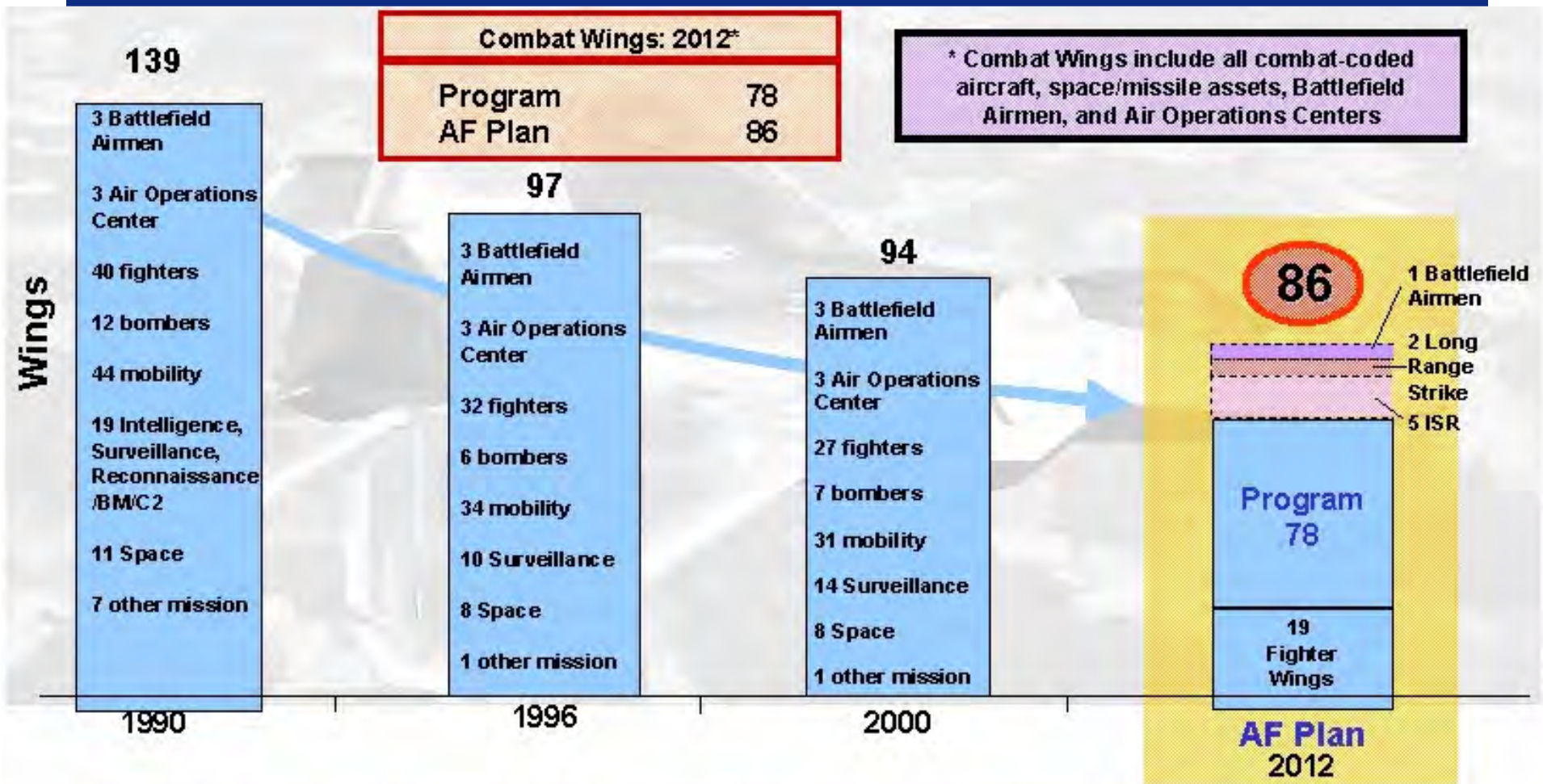
- **Mission: Plan, command, control and execute air, space and information capabilities across full range of military operations**
- **Provide Operational-level C2 Supporting geographic and functional CC's**

- **A-Staff re-organization**
- **Capability to immediately transition from Day-to-day to major operations**
- **In-place COMAFFOR of assigned or attached forces**





The Combat Wing Transformation



We size the force in Wings to meet warfighting requirements

Integrity - Service - Excellence



Force Presentation





The Air Expeditionary Force

- Provides predictability and stability to our Airmen during normal battle rhythm ... with a planned and orderly transition to surge using an equitable, consistent and methodical approach, transparent to all commanders
- Stresses in certain career fields (LD/HD) will make their battle rhythm less predictable (i.e. extended tour lengths, more frequent deployment rotations, etc)
- The AEF Cycle is based on forces aligned in five “pairs”
 - Each “pair” equates to a four-month deployment window
 - Five AEF “pairs” make up one 20-month AEF “cycle”
- The AEF is the Air Force’s system for presenting forces to COCOM’s

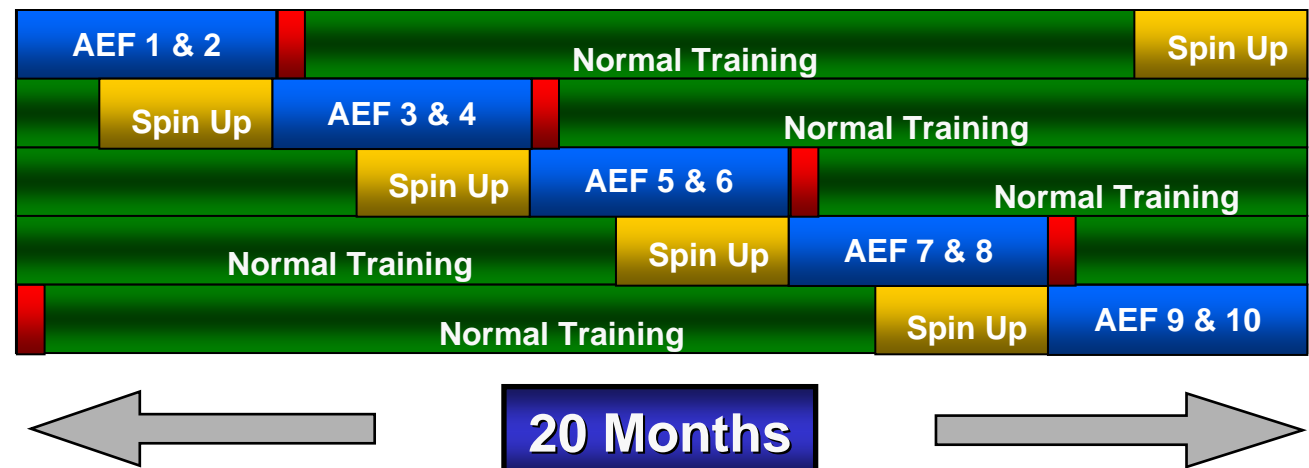


How the AEF Works

- 2-3 Combat Wings (Shooters)
- 2 Mobility Wings (Tankers/Airlift)
- 1-2 Mobility Squadrons (C-130)
- 1-2 Recon Squadrons
- 1 Bomber Squadron
- 3-4 Austere Locations
- AF Special Ops Base

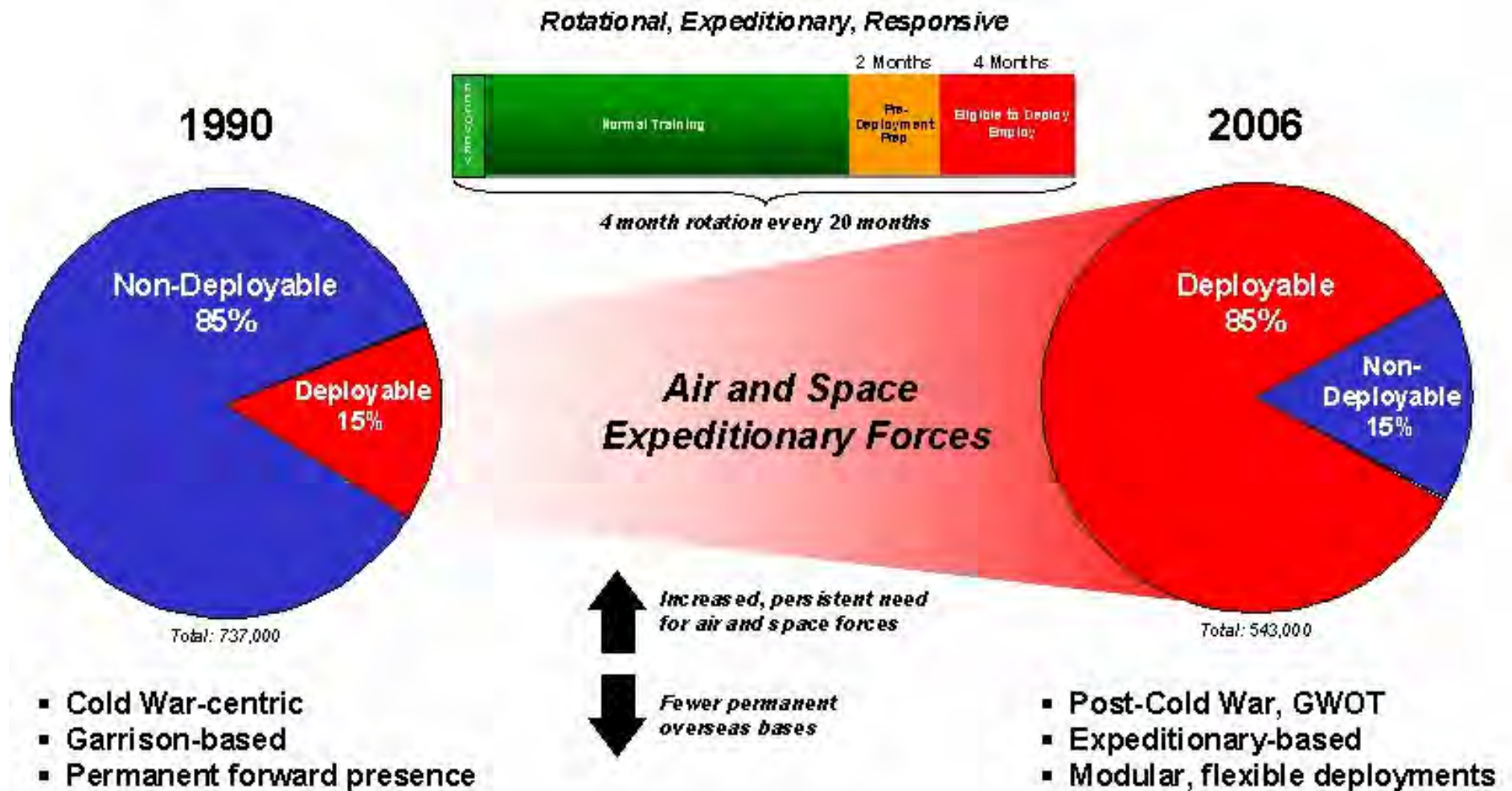
A “Typical” AEF

AEF Deployment Timeline





“Every Airman Deployable”





Air Force Engagement in Expeditionary Warfare

- In Today's World . . .
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 - How the AEF works
- **Enhancing Joint Warfighting – The Air Force Portfolio of Capabilities for Expeditionary Warfare**
 - **Global Strike**
 - **Global Mobility**
 - **Persistent C4ISR**
 - **Agile Combat Support**



Global Strike . . . Preserving Sovereign Options

- **Global Strike** – Ensure continuous 5th Generation fighter industrial base, and develop next generation LRS capability (increased range, payload, with rapid response)
 - **F-22A: Air dominance** – integrated avionics & sensors, advanced stealth, and super cruise insure a lethal, survivable, and unrivaled A/A capability
 - **F-35: Precision strike** – multi-role stealth fighter meeting the future needs of the AF, Navy, USMC, and our Coalition Allies
 - **Long Range Strike:** Modernize the legacy fleet (B-1, B-2, & B-52) & field a next generation bomber capability by 2018 (enhanced speed, range, payload, connectivity, & survivability)

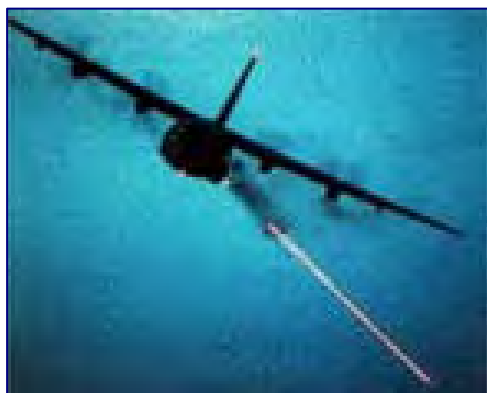




Enhancing Joint Warfare – Global Strike (CAS)



- **A-10C – Upgrade the A-10 to “precision engagement” configuration – new cockpit avionics/flight controls and the ability to drop any bomb in Air Force inventory will enhance the CAS kill chain in irregular operations.**



- **Gunship: Increase AC-130 fire control accuracy, improved multi-spectral sensor for enhanced target ID, and ROVER feeds (from Predator/Warrior); begin study for next generation gunship**



Enhancing Joint Warfare – Global Strike (Special Ops)

- **Special Ops – CV-22 acquisition (50 aircraft) will provide a revolutionary capability to our special ops forces**



- **CSAR-X: 141 CSAR-X to replace HH-60G. Combat Search And Rescue is a core AF competency that must be recapitalized — leave no one behind on the battlefield.**





Enhancing Joint Fires and Effects

- Increasing terminal attack controllers by 1,000 and adding 120 Combat Aviation Advisors
- Joint Fires Integration and Interoperability team started at Eglin in Feb 2005 (JFCOM)
- Equipping Theater Airborne Reconnaissance System (TARS) with SAR for all weather, night, and real-time CAS
- Activating AFSOC Predator sqdn
- Small Diameter Bomb (SDB) fielded & deployed in combat operations this month

Close Air Support is a key Air Force capability for expeditionary operations



Global Mobility

"Get There the Fastest With the Mostest"

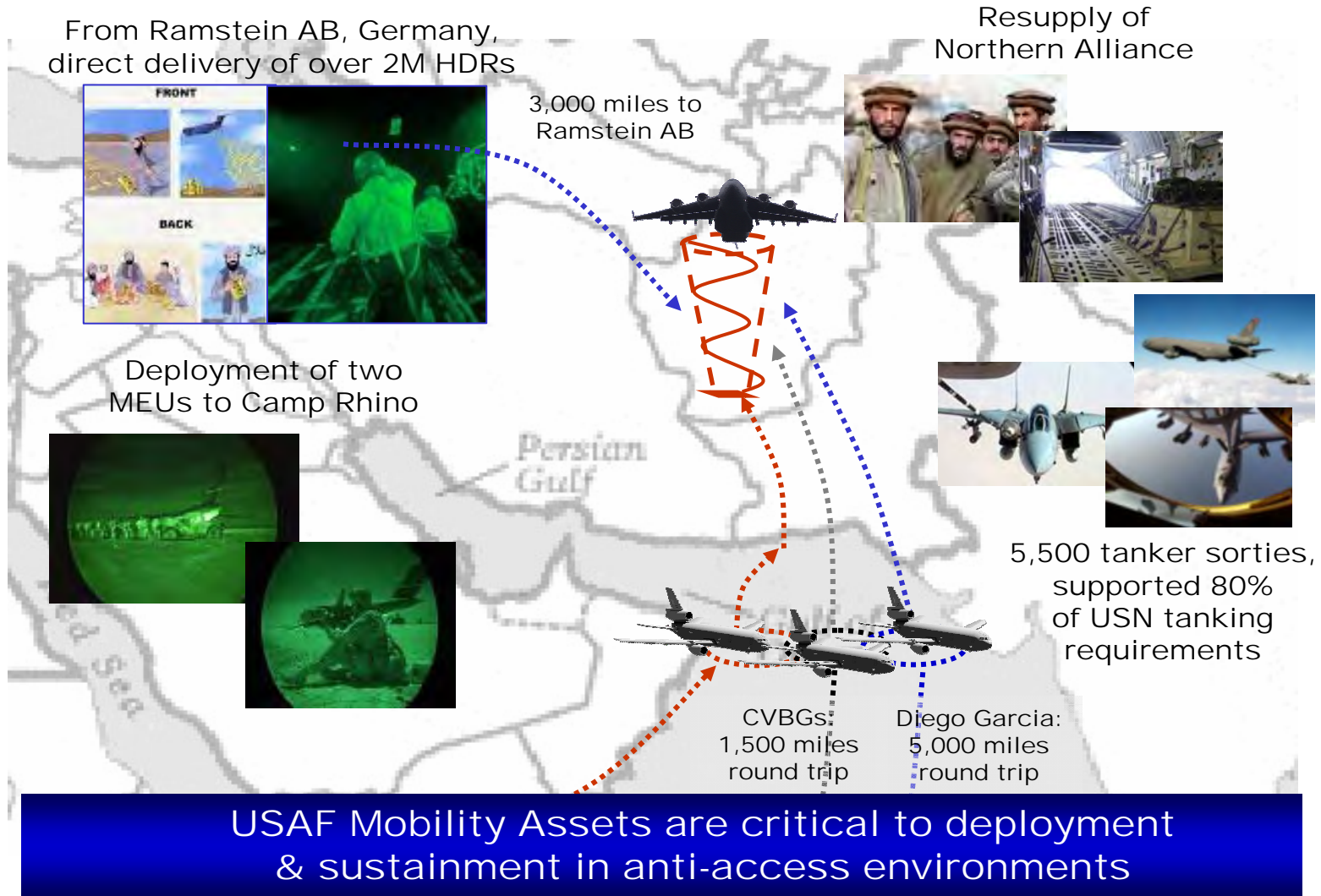
- **Global Mobility – We have an urgent need to replace 45-year old tankers, modernize legacy airlift aircraft, and procure a Joint Cargo Aircraft (JCA)**
 - **KC-X: AF must start recapitalizing aging tanker fleet now, and most cost-effective option is a fleet of new, medium-to-large commercial derivative tankers**
 - **JCA: AF is DoD's airlift provider, and JCA will provide a niche capability to support joint warfighters at home and in the field**
 - **C-17: A modernized C-5 fleet combined with a 190 aircraft C-17 fleet enables the Air Force to manage risk effectively now and in the future (defined by the QDR-validated Mobility Capabilities Study)**





Global Mobility

Keeping Expeditionary Operations Sustained





Flying and Fighting in Cyberspace

- **Persistent C4ISR – Expand global ISR capabilities in air and space, and increase our focus on Cyberspace**
 - **Space situational awareness: Keystone to dominance of space, and we will provide transformational space surveillance and modernized legacy capabilities**
 - **MQ-1/RQ-4: To meet joint warfighting requirements, fulfill QDR commitment to 21 MQ-1 orbits and TFI commitment to 5 ANG MQ-1 units, and ensure seamless transition from U-2 to RQ-4**
 - **DCGS: Expanded weapon system capabilities and integrated Total Force with two new ANG sites and ARC manpower**
 - **AEHF / WGS / TSAT: Recapitalized MILSATCOM fleet to deliver more bandwidth to the joint warfighters**
 - **Objective Gateway: Funded airborne data relay platform to allow robust netcentric operations to support the joint warfighters**



Expeditionary Reachback ...Moving Data...Not People

- OEF and OIF clearly demonstrated the practical application and advances the Air Force has made in “reachback” using systems like Predator and Global Hawk coupled with advances in C4ISR
 - Stateside AF units sent over 30,000 reports and identified over 1,000 targets for forward deployed units
 - Instead of deploying 2,000 airmen, only 90 were needed to move forward
 - The Air Force saved between \$6-15 million dollars by not deploying two intelligence ground stations and eliminated 34 C-5 airlift missions
 - Reachback also reduced the kill chain timeline in OIF to minutes
- Future conflicts will feature on demand space sensors, shared battlefield picture via UAVs, & persistent near-space surveillance

Persistent C4ISR uses “Reachback” to Support Forward Presence



Agile Combat Support

- **Agile Combat Support – Become more efficient and effective to free up resources to support COCOM warfighting needs and transformation**
 - **Manpower/Contractor Redux:** We must resize and reshape the force to live within allotted resources while meeting our obligations as an integral part of the interdependent, joint force
 - Remaining focused on supporting joint warfighters and OPLANS
 - **Operational Risk:** Assumed additional operational risk to balance GWOT with recapitalization and modernization requirements
 - Reduced flying hours, DPEM, MILPERS, & infrastructure
 - **Infrastructure:** Funded critical new mission requirements while limiting investment in Cold War infrastructure



Agile Combat Support Forces Will Enhance Joint Basing at Guam

- **The Air Force plans for rotating/basing bombers, fighters, Global Hawks, and KC-135s at Anderson AFB**
 - **554th Red Horse Sqdn began move (Korea to Guam) last week**
 - **36th WG Contingency Response Group**
 - **Mobility Response Squadron**
 - **Security Forces Squadron**
 - **Medical Squadron**
 - **Intelligence Division**
 - **Logistics Planning Division**
 - **Combat Support Trng Squadron**
- **Starting in 2008, the III MEF HQ and 8,000 marines move to Guam**
- **USN wants ability to service CVNs and will add SSGNs to Guam basing**
- **This summer, the Valiant Shield exercise at Guam involved 30 warships, 280 aircraft, and 22,000 personnel**
- **Agile Combat Support and Guam Joint Basing play a vital role in our Pacific Strategy**





Summary

The Air Force in Expeditionary Operations

- U.S. national security and defense strategy stresses the need for the U.S. military to be expeditionary
- The USAF has been expeditionary since the end of the Cold War
- AEFs are the Air Force's way to organize and present its forces to the COCOMs
- The Air Force is a part of the joint, interdependent warfighting team with distinctive capabilities in:
 - **Global Strike** – The ability to provide Strategic Attack, Interdiction, or immediate CAS to those fighting the enemy “danger close”
 - **Global Mobility** – Getting forces to the fight and supplying our main operating bases and forward operating locations
 - **Persistent C4ISR** – Provide an “unblinking eye” from the national command authority down to the soldier on point
 - **Agile Combat Support** – Providing responsive support to the expeditionary warfighter

Today's Air Force is Fighting an Expeditionary War..."

- General Moseley, CSAF



www.af.mil



The Interdependent Fight



Integrity - Service - Excellence



Questions?



Integrity - Service - Excellence

Unmanned Aircraft Systems (UAS)

USMC NDIA EWC Conference



Flying Sergeants



First Flight



War on Terror



Galileo



Daedalus

LTC Jennifer Jensen
Product Director,
Common Systems Integration



Topics

- **Army UAS Operations**
- **Interoperability, Commonality, Standardization**
- **Path Ahead**

Beer for Horses



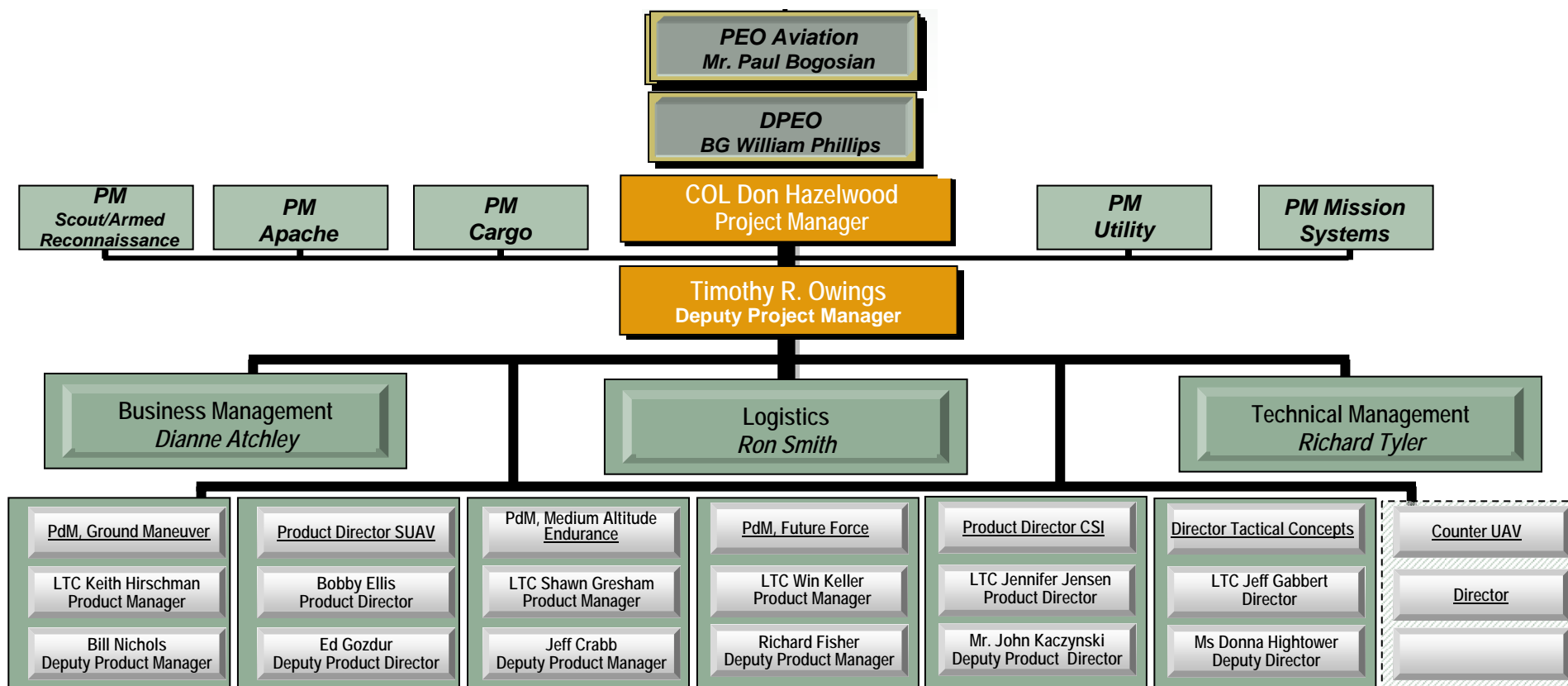
Organization and Vision

Vision

Become the Department of Defense “Materiel” Center of Excellence for all Unmanned Systems

Mission

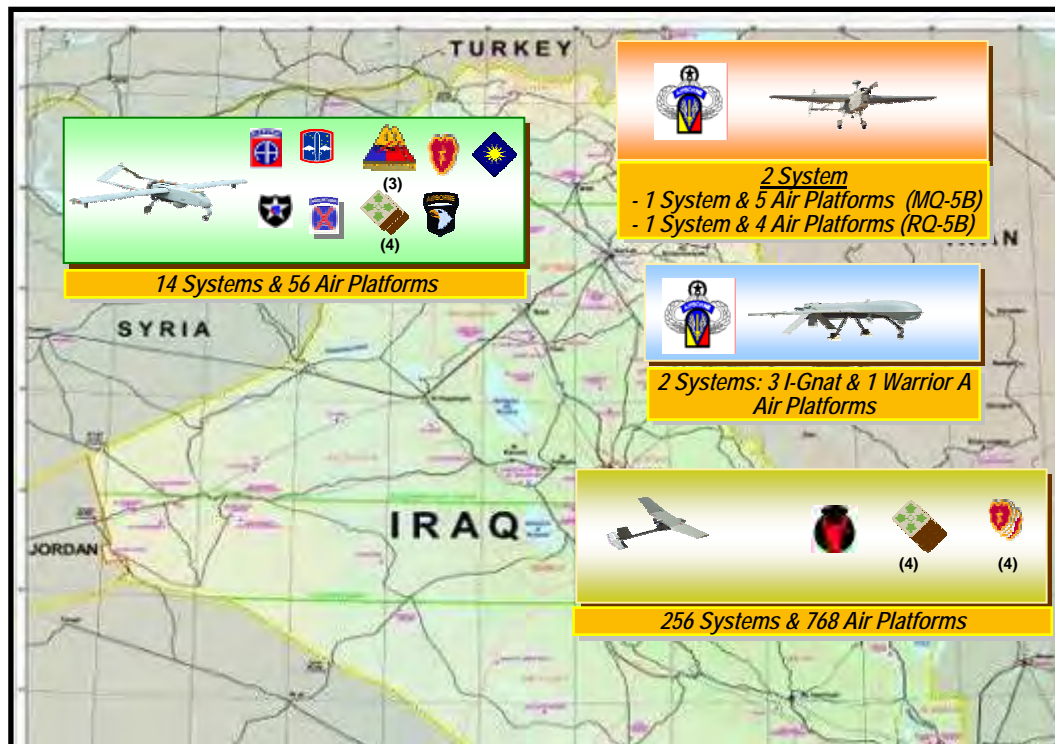
Provide the Department of Defense with World Class Unmanned Systems that are interoperable with joint and coalition partners, common with other Army systems and affordable through excellence in program management





Supporting the Warfighter

Current Situation



Field Support Representatives in Country

Total Hours Flown : 215,391
 OIF/OEF Hours Flown: 162,071

**75%
 Combat Hours
 Flown**

UAV	Sorties	Hours
IGNAT	889	12,900
HUNTER	10,982	44,771
SHADOW	33,830	128,952
RAVEN	30,119	28,768

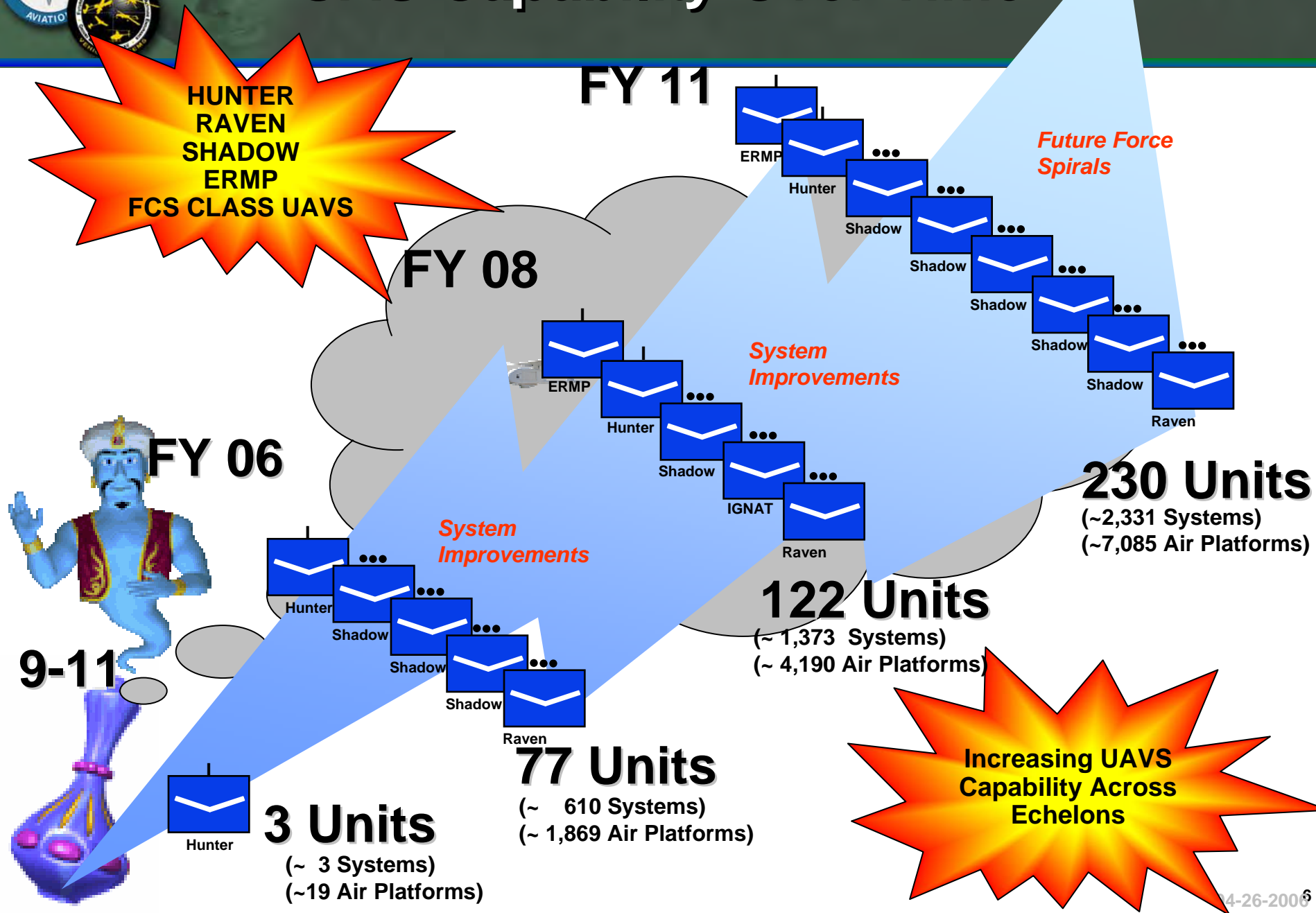
FY05
 81% of UAV Hours Flown on 11% of DoD Unmanned A/C Budget

FY06
 90% + of UAV Hours Flown on 15% of DoD Unmanned A/C Budget

"This technology is changing the way we fight and we will not go without."
Task Force Commander in Theater



UAS Capability Over Time





One System Ground Control and Remote Video Transceiver

1996 - 2005

2006-7
Block I

2008 - 2010
Block II

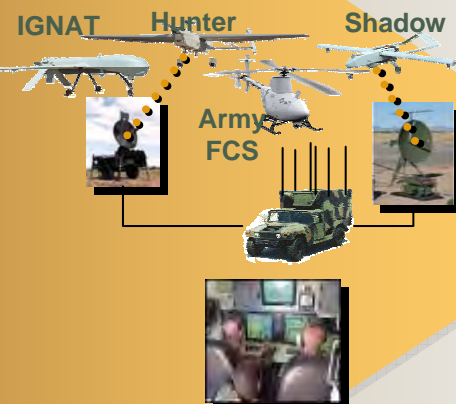
Ground Station



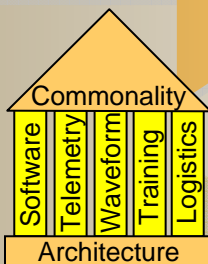
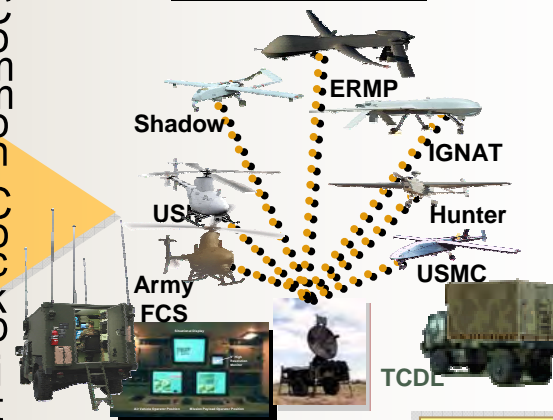
7 Configurations

- Logistical requirements (Manuals, Software Maintenance, PLL)
- Multiple Training requirements
- Limited Situational Awareness

One System GCS



Common Cockpit



Commonality

- Common Cockpit Philosophy leads to:
 - Reduced logistical requirements
 - Common Training/Standardization
- Open ended architecture (accepts FCS)
- Maximizes situational awareness technology

Increased Operational Effectiveness

Cost Avoidance

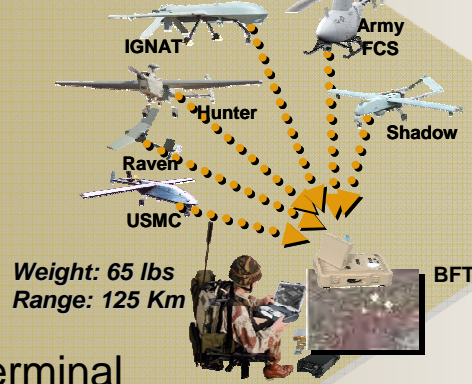
Remote Video



Weight: 350 lbs
Range: 40 Km

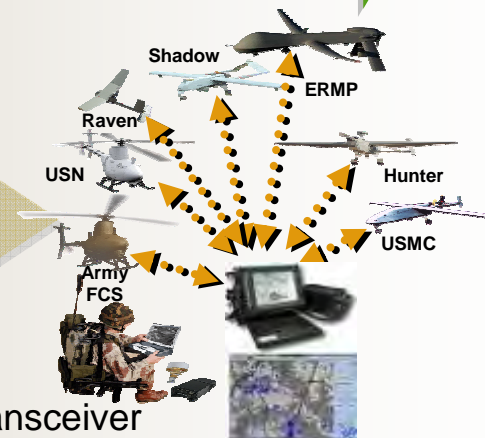
One System RV Terminal

SA at Platoon



Weight: 65 lbs
Range: 125 Km

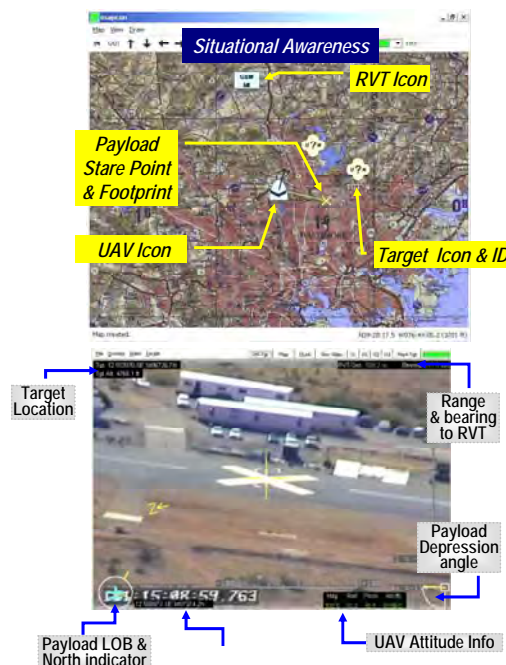
One System RV Transceiver





One System Remote Video Terminal

E-ROVER III Components



DESCRIPTION

OSRVT is a kit that is integrated onto the ROVER III System that provides enhanced situational awareness with near Real Time Video and Telemetry Data from multiple manned and unmanned platforms: Hunter, Shadow, Predator, Pioneer, IGNAT, other UAS and manned Litening Pod platforms.

The OSRVT kit consists of UHF Modem, cables, software and an optional extended range antenna. Software supports decoding Telemetry and META Data from multiple UAS, links data onto FalconView maps, and supports Off Target Calculations.

CAPABILITIES

- Auto Detection
- Telemetry Data Linked to FalconView With 2525 Symbolology
- JPEG Files With Embedded Metadata
- Off Target Calculations
- "John Madden" Functionality
- Tri-Band (C/L/Ku) Extended Range Antenna, up to 80km (Optional)
- S-Band Planned for 2 QTR FY 07

E-ROVER III

- \$35K, 2-6 Month Lead Time
- 6 Month Warranty

OSRVT

- \$20K, 2 Week Integration Time
- \$45K for Extended Range Antenna (Optional)

SYSTEM DELIVERIES

- 20 systems in Nov, 10 systems in Dec – TF Odin
- 20+ Systems, 1st QTR FY 07 – Various Units
- 14 Systems, 1st QTR FY07 – 82nd Airborne
- 45 Systems, 2nd QTR FY07 – TUAV (Shadow)

CONTACT INFORMATION

OSRVT Contact:
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Product Director, Common Systems Integration
(256) 895-3377
jennifer.jensen@us.army.mil

OSRVT Contact:
MAJ Scott Hamann
OSRVT Lead, Deputy PD CSI
(256) 895-3367
scott.hamann@us.army.mil

ROVER Contact:
MAJ Dan Walter
PM ROVER
(937) 255-8016
daniel.walter@wpafb.af.mil



CSI Vision, Mission, Goals

Vision: Become the US Government & Worldwide leader in Excellence for Joint Interoperability and Commonality of All Unmanned Aircraft Systems.

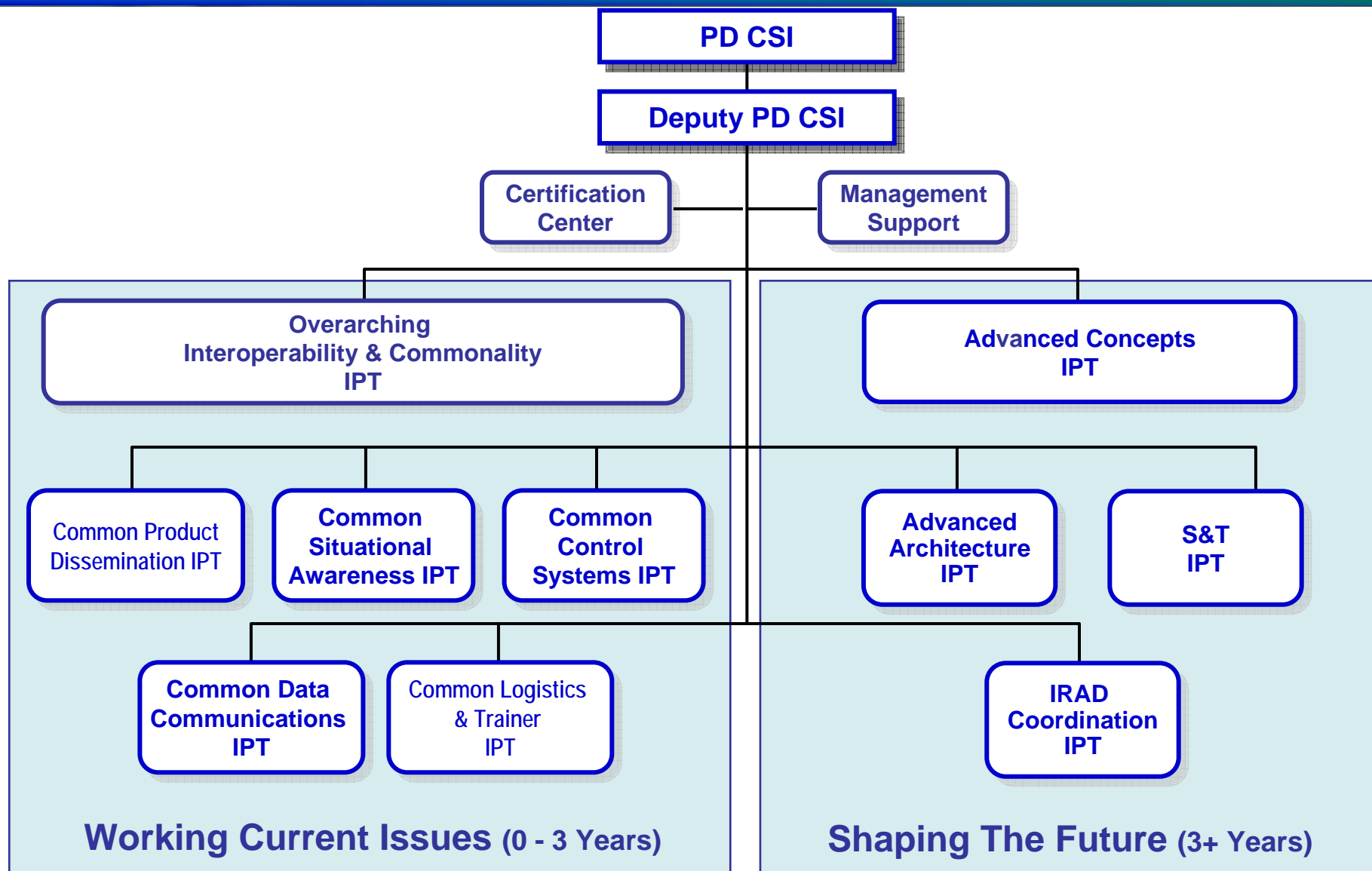
Mission: Develop Common Solutions to Support Unmanned Systems through Horizontal Integration, which Reduce Life-cycle Costs and Increase System Interoperability through the Joint Battlespace.

Goals:

- To provide the necessary guidance to UAS Product Managers and their Prime Contractors to Improve Deficiencies and Achieve Interoperability & Commonality Compliance...by Providing Documented Requirements & Performance Specifications
- Develop Horizontal Integration of Interoperability & Commonality Across Army UAS
- Develop Interoperability with Manned Aviation Platforms
- Provide Situational Awareness Domination to the Army & Joint Forces through Standard Dissemination Develop Common Airspace Integration Solutions
- Horizontal Integration of Technology Across Army UAS
- Bridge the Gap Between Current Modular Force and Future Force
- Develop Common & Cost Effective Supportability & Logistics



How We Are Structured To Meet Goals



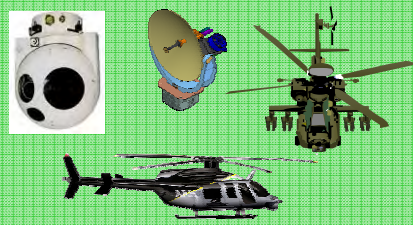


Common Systems Integration Methodology

Joint Programs



External Army Programs



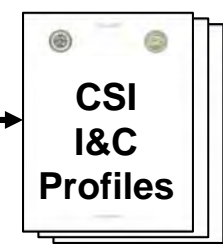
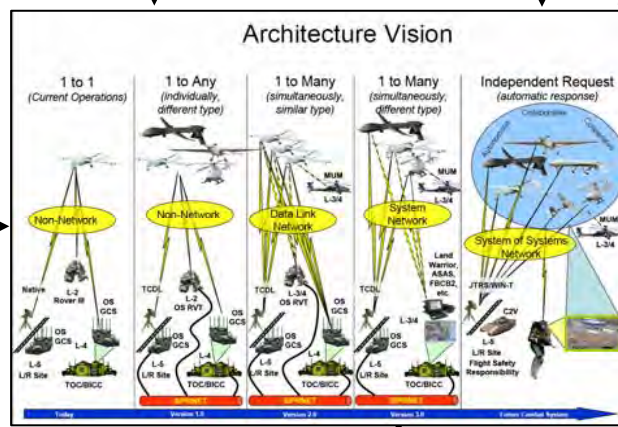
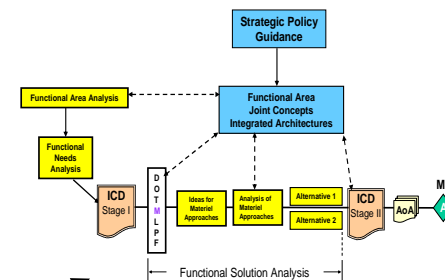
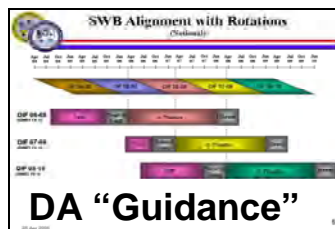
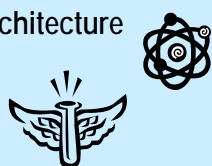
Internal UAS Programs



Advanced Concepts

Advanced Architecture

S&T



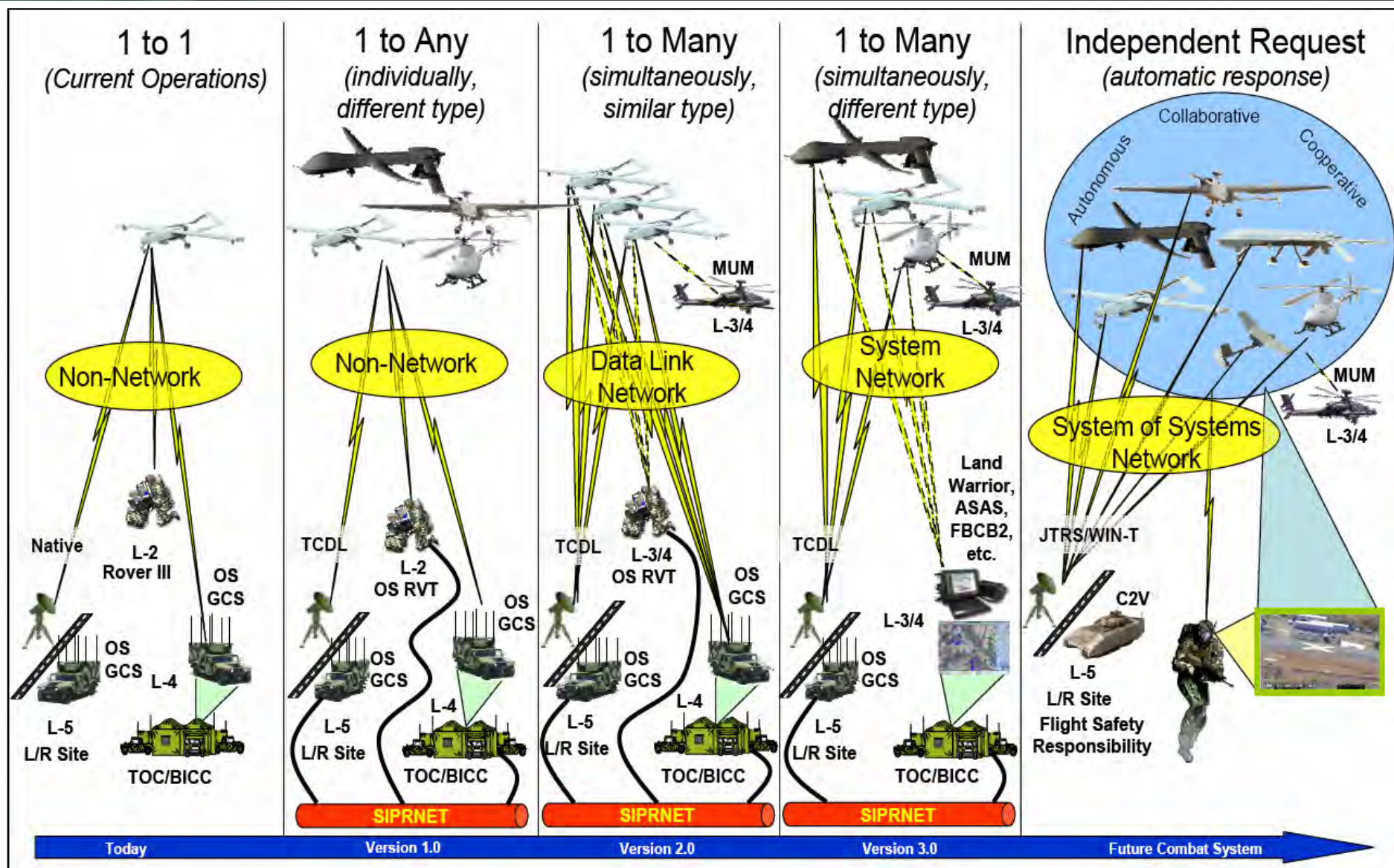
UAS Interoperability Capabilities Road Map (Defined Capabilities)



Do Not Yet Exist!



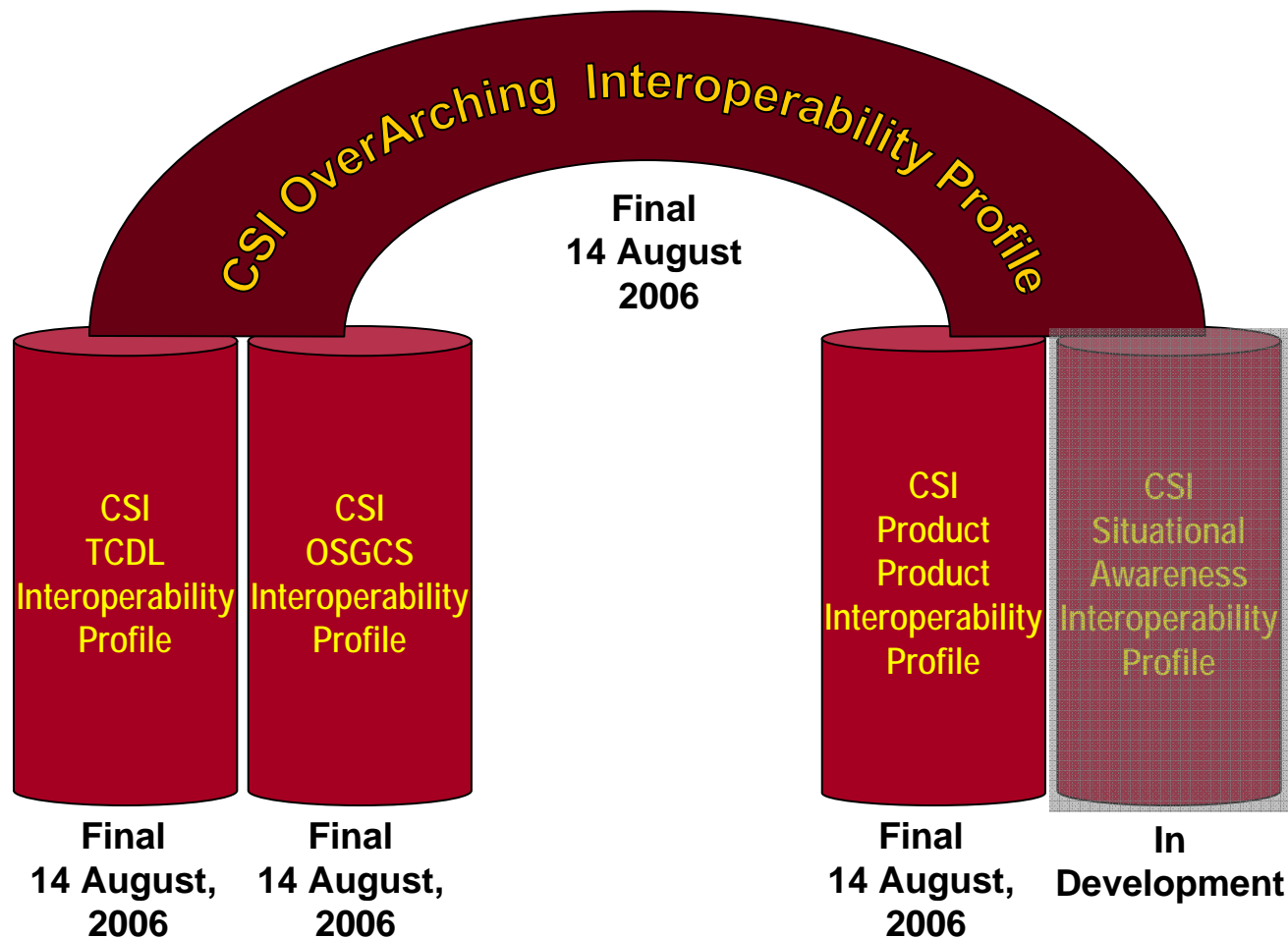
Architecture Vision





Army UAS Version 1.0 Interoperability Profiles

Describes End-to-End Interoperability from the Sensor to the Warfighter, Hot Swap Interoperability between Shadow and Warrior Platforms, and Growth to other Platforms. Includes Common Mission Planning, Training, and Warfighter Machine Interfaces.














Interoperability Profile Documentation

- Version 1.0 Interoperability Profiles
 - Draft Released Comments (05 May 2006)
 - Final Release (14 August 2006)
- Overarching Guidance
 - Compliance of Standards No Later than 4QFY08 or the Systems' IOT&E
 - Product Managers are Encouraged to Assess the Cost and Schedule Impacts of all CSI Guidance
 - If Cost and Schedule Impacts are too Onerous, Apply to Product Manager CSI for a Waiver
 - Burdens of Implementation are upon the Products, Compliance with CSI Guidance is to become a Required Aspect of the Assembly of a PM UAS Program Management Acquisition Strategy
 - Compliance of standards is not Required for PM UAS' FCS Systems
- Core “Common” Document - Does/Does Not
 - Does Provide Interoperability Requirements across Platforms
 - Does Not Dictate Design Solution
 - Does Allow for Design Space
- Annexes – Platform's Exception to Common Core Document



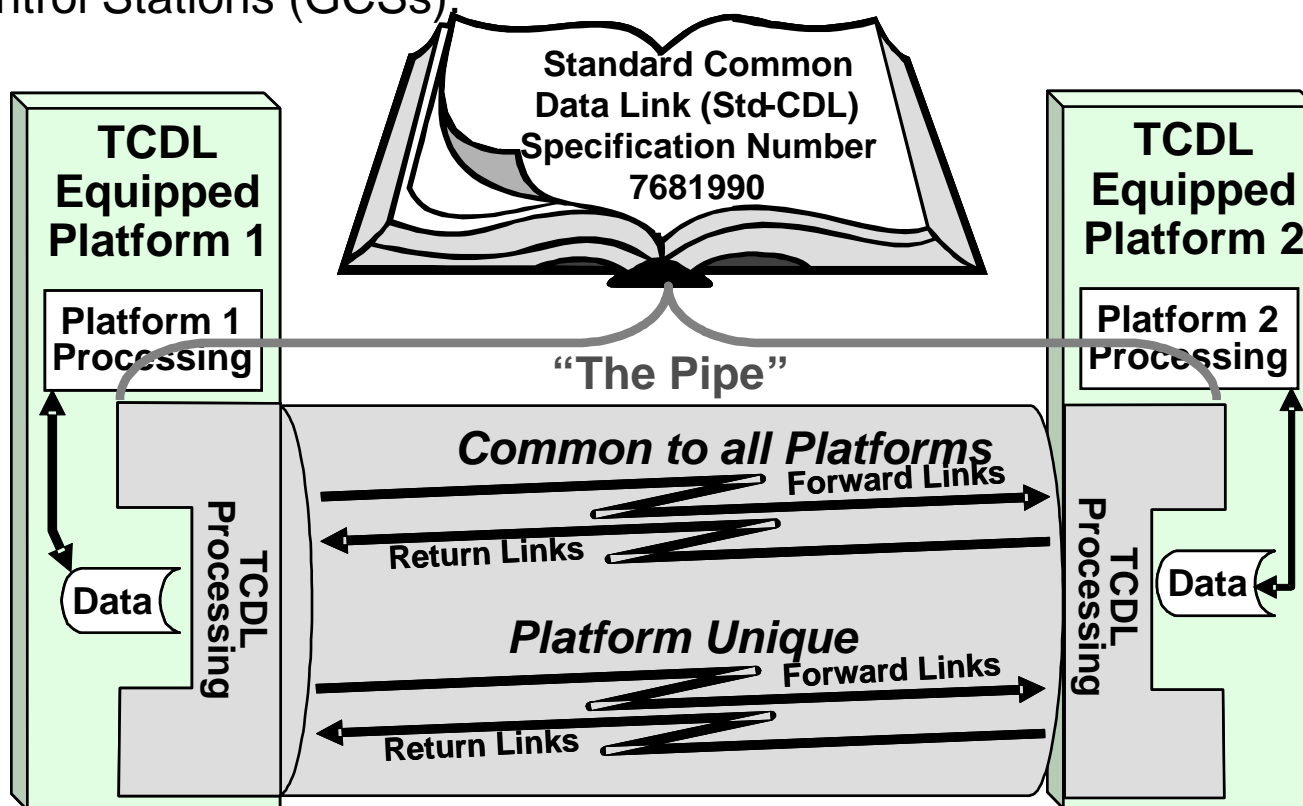
Joint Interoperability Path Ahead

	2006	2007			
	S	O	N	D	J
Aviation Interoperability Summit (19 Sep)					
Army, Navy, USMC Working Meetings (25 -26 Sep)					
NAVAIR I-CDL Special Interest Group (27 Sep)					
Brief JMRB (05 Oct)					
Develop Draft Joint Interoperability Profile Document (27 Oct)					
Coordinate with US Air Force (Nov)					
Joint WG Meeting - Final Document (Wk of 5 th)					
Present to CDL Executive Agent (wk of 12 th) "DoD Interoperability Standard"					
Work Through OSD Chains To AT&L For Signature Of DoD Interoperability Mandate					



TCDL Interoperability Profile

- Purpose: Define the Common and System Specific Operating Parameters/Profiles, as Specified in the Waveform Specification for the Standard Common Data Link (Std-CDL) Specification Number 7681990, for Tactical Common Data Link (TCDL) waveforms used by US Army Unmanned Aircraft Systems (UASs) and Associated Ground Control Stations (GCSs)





FY 07 Integrated Product Teams Migration

Overarching
Interoperability & Commonality
IPT

OSRVT

Blue Force Tracker

OSGCS

TCDL

Common Trainer

Common Product
Dissemination IPT

Common
Situational
Awareness IPT

Common
Control
Systems IPT

Common Data
Communications
IPT

Common Logistics
& Trainer
IPT

1. One Systems Remote Video Terminal (OSRVT)
2. KLV/Meta Data
3. C4I
4. Video Storage & Dissemination (PCTE Like)
5. SmartCam
6. MPEG-2/H.264 Compression
7. Encryption

1. Blue Force Tracker (BFT) /FBCB2
2. Link -16
3. Airspace Integration/ TAIS
4. Sense & Avoid / Collision Avoidance

1. STANAG/ Vehicle Specific Module (VSM)
2. Core UAV Control System (CUCS)
3. Payloads / Weapons C2
4. Mission Planning / PFPS
5. Vehicle Control Software (VCS)
6. Air Worthiness (Ground Implementation)
7. Common Takeoff & Landing System
8. GATM/CNS/ATM

1. TCDL/Digital Data Links
2. WiFi/WiMax
3. Networks

1. IMS (Trainers)
2. MUSE
3. IETM
4. Health & Usage Monitoring Systems (HUMS)
5. Readiness Reporting



UAS Support



What you See.....

**Is the tip of
the
Iceberg.....**



Conclusion

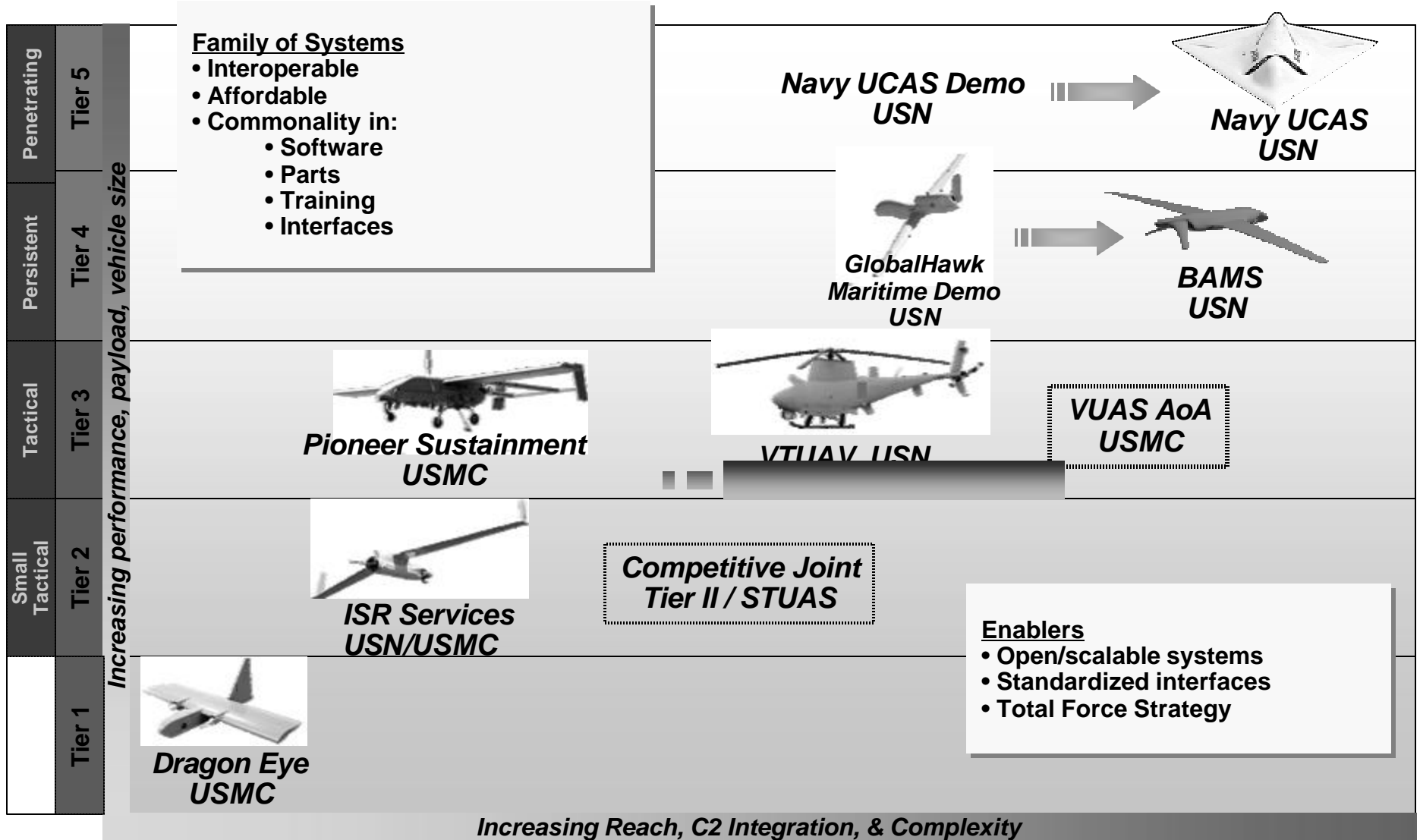
Support The Warfighter

- **970 Army unmanned aircraft vehicles deployed**
- **Highest OR Rate and OPTEMPO in Theater**
- **Establish Interoperability Standards**
- **Improve horizontal integration across manned and unmanned systems**

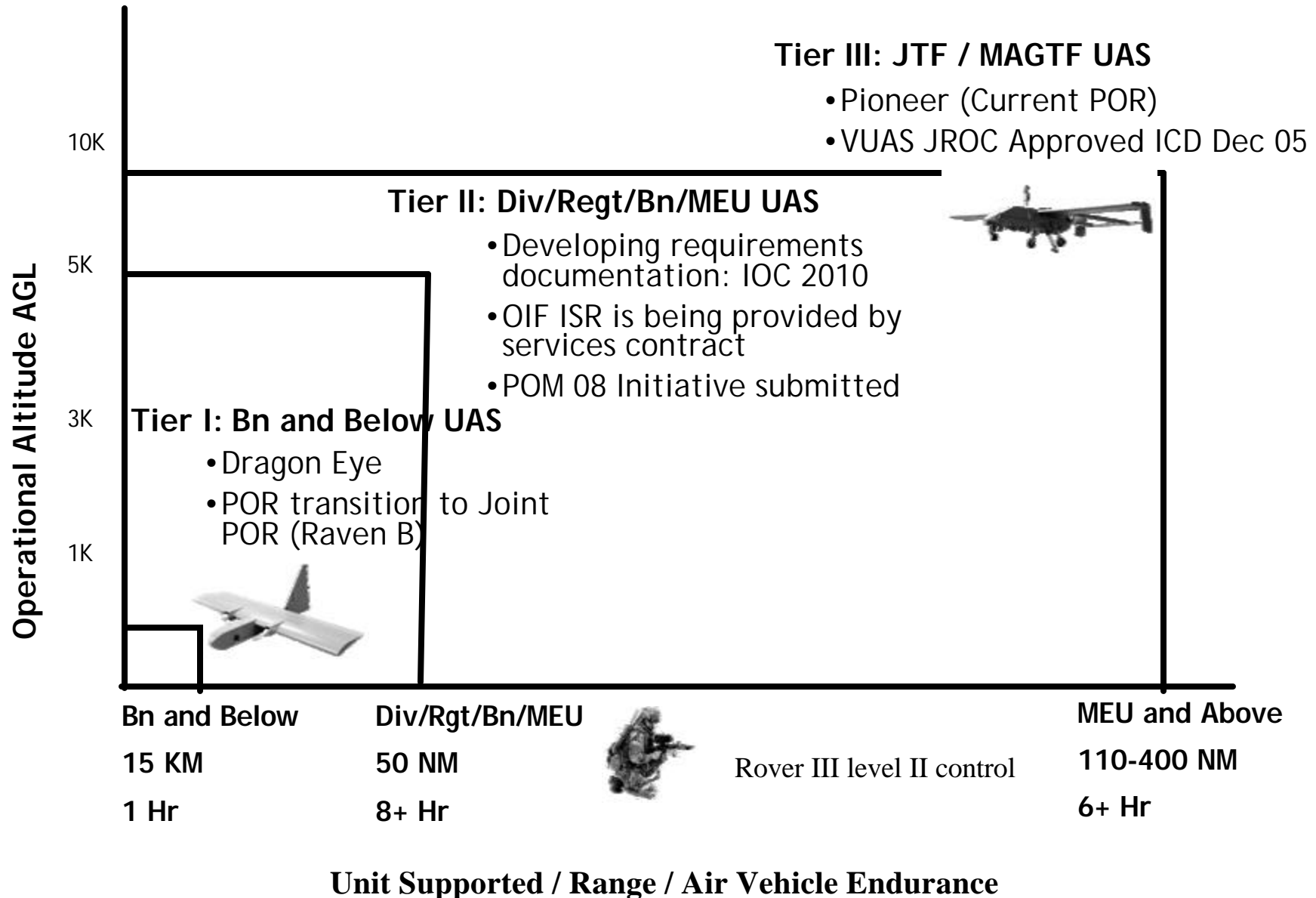
Last to Leave Theater

...on the fringe of
interoperability

Naval UAS Family of Systems

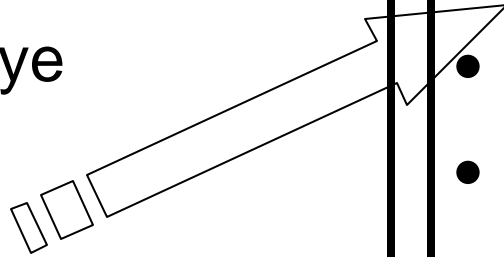


USMC Three-Tier UAS Strategy



UAS Efforts

- Tier-I
 - Dragon Eye
 - Raven-B
- Tier-II
- Tier-III
 - Pioneer
 - VUAS
- RVT
 - ROVER



Tier-II

- ISR Services
- MCWL Concept Demonstrator
- ISR Services Competition



Workhorse



Focus, Shift, Align

- MCSC & PEO(W) MOA
 - MDA
 - ERB
- ASN-RDA Memorandum
 - GWOT
 - USMC Support
 - Program Migration
 - TIER-II Program of record



THE ASSISTANT SECRETARY OF THE NAVY
RESEARCH, DEVELOPMENT AND ACQUISITION
1000 NAVY PENTAGON
WASHINGTON, DC 20350-1000

JUL 17 2006

MEMORANDUM FOR DISTRIBUTION

SUBJ: ASM (RDA) Support for United States Marine Corps

In order to best support the Department of the Navy's role in the Global War on Terrorism (GWOT), and the United States Marine Corps' role in that fight, I am asking Roger Balth, DAHM(LNW), to focus the majority of his time on UMC development and acquisition programs and ONOT program development and rapid fielding requirements. This will also include Counter Radio Controlled Improved Explosive Device countermeasures under SECNAV's executive agent role for DoD. So that he may be most effective in his modified assignment, I have asked that the following groups of programs move to other DASHs:

Tactical Tomahawk DASN(AIR)

ASW Programs DASN (TW8)

Naval Coastal Warfare DASH(C4I)

Marine Corps UAV programs DASH(AIR)

Details of the program movements are available on the attached spreadsheet. These changes are effective immediately. Personnel moves in association with this change of program responsibility will be made shortly.

Delores M. Etter
Delores M. Etter

Attachment:
As stated

Tier-II POR

- ICD development and leadership: DC CD&I
- Program management: PMA-263
- MDA: PEO(W)
- Resource Sponsor: N-86

NDIA Study

1. UAV stovepipes...biggest barrier
2. ...no one in Industry moving toward architecture commonality
3. ...compliance with [standards] is not being mandated
4. Organizational resistance to change is easily the most intractable obstacle
5. The group recommended that the Defense Department designate a single office to be in charge of mandating commonality within the UAV programs, as well as the budget authority to enforce standards

NDIA Study (con't)

6. A top level architecture can be common, but must fit within a concept of operations.
7. ...UAV concepts of operations are inconsistent in their approach to C2 interfaces
8. ...A similar problem exists to the data that UAVs collect and disseminate

...man in the mirror

NDIA Common UAV Architecture Study

RECOMMENDATIONS
CONCLUSIONS
TO BE
AS IS
APPROACH

- Industry cannot support architecture commonality without government intervention
- Industry is eager to partner commonality initiatives **as directed by the government**
- In the absence of strong industry incentives to do so, the benefits **do not in themselves justify corporate commitment** to commonality at the expense of corporate proprietary information

"A bird in the hand is worth two"

NDIA Common UAV Architecture Study

RECOMMENDATIONS
CONCLUSIONS
TO BE
AS IS
APPROACH

- Make UAV architecture requirements available to industry as early in concept development as possible
 - **Use industry as a partner** in developing the best architecture for the warfighter
- Understand the baseline as early as possible
 - Build the flexibility in that will
 - Any change, for any reason
- Mandate "commonality incentive the procurement and acquisition"
 - Mandatory requirements in
 - Performance clauses that n
 - Award fees that stipulate ar
 - Design specs that meet cor

Practically Speaking...

NDIA Common UAV Architecture Study

- Commonality will fundamentally **transform** UAV operations
 - **Every** UAV manufacturer will be affected
 - **Every** user, operator, and trainer will be affected
- Everyone who sees commonality as a **threat to their turf** is going to fight this
 - In the halls of the Pentagon, on the Hill, and in industry
- Commonality will have to be **top-down** directed and supported
 - Making things simpler - and cheaper - is **not** the natural order in a bureaucracy
 - Somebody has to be in charge, with the authority **and resources** to do the job
- Commonality is within reach, but we must **start now**
 - "Pay me now. or pay me - **a whole lot more** - later"

Impediments to interoperability

- UUNS & Proprietary data
- Selective Interpretation & Selective Implementation
- Acquisition system Vs Technology refresh vs Operational context

The Six Phases of Every Project

1. Enthusiasm
2. Disillusionment
3. Panic
4. Search for the Guilty
5. Punishment of the Innocent
6. Praise and Honors for the Non-Participants

Lexicon

- Interoperability Vs.
 - Interdependence
 - Commonality
 - Compatibility
 - Integrated
- Standard definitions
 - TIERS
 - Elements
 - Enablers
 - CLASS
 - C2
 - Architecture
 - Standards
 - Interfaces



Types of Interoperability

- Technical- Standards (STANAG)
- Operational-CONOPS (NOC)
- Programmatic- Design, Structure
- Industrial-Cooperation
- Leadership-Policy “Hammer”
- Emergent-von oech

- D
- O
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- E
- M
- I
- L
- P
- F




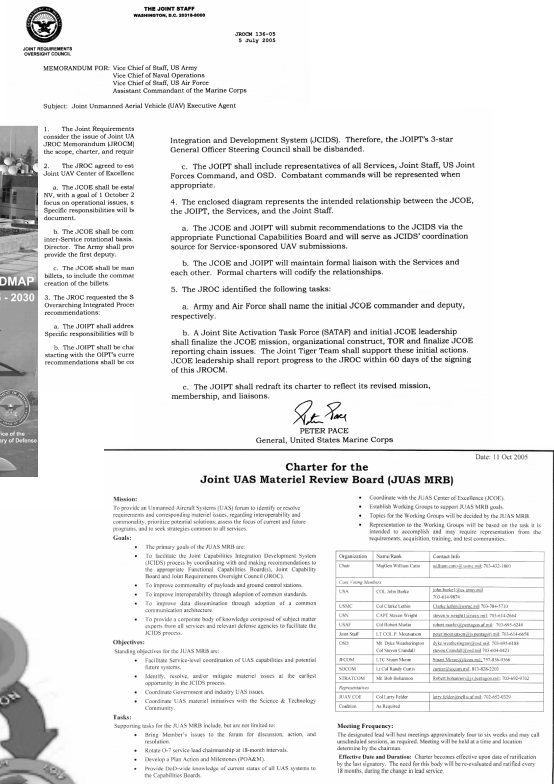
Expanding our Concept of Interoperability

- HP Hospital Monitor
- Lego factory
- iTunes
- FSR



Recipe for success

- Boundaries and constraints
 - Article 142
 - Guides and Sherpas
 - JROCM 136-05
 - JCOE
 - JUAS-MRB
 - Play Book
 - UAS road map
 - Orientation
 - The individual warfighter
- 

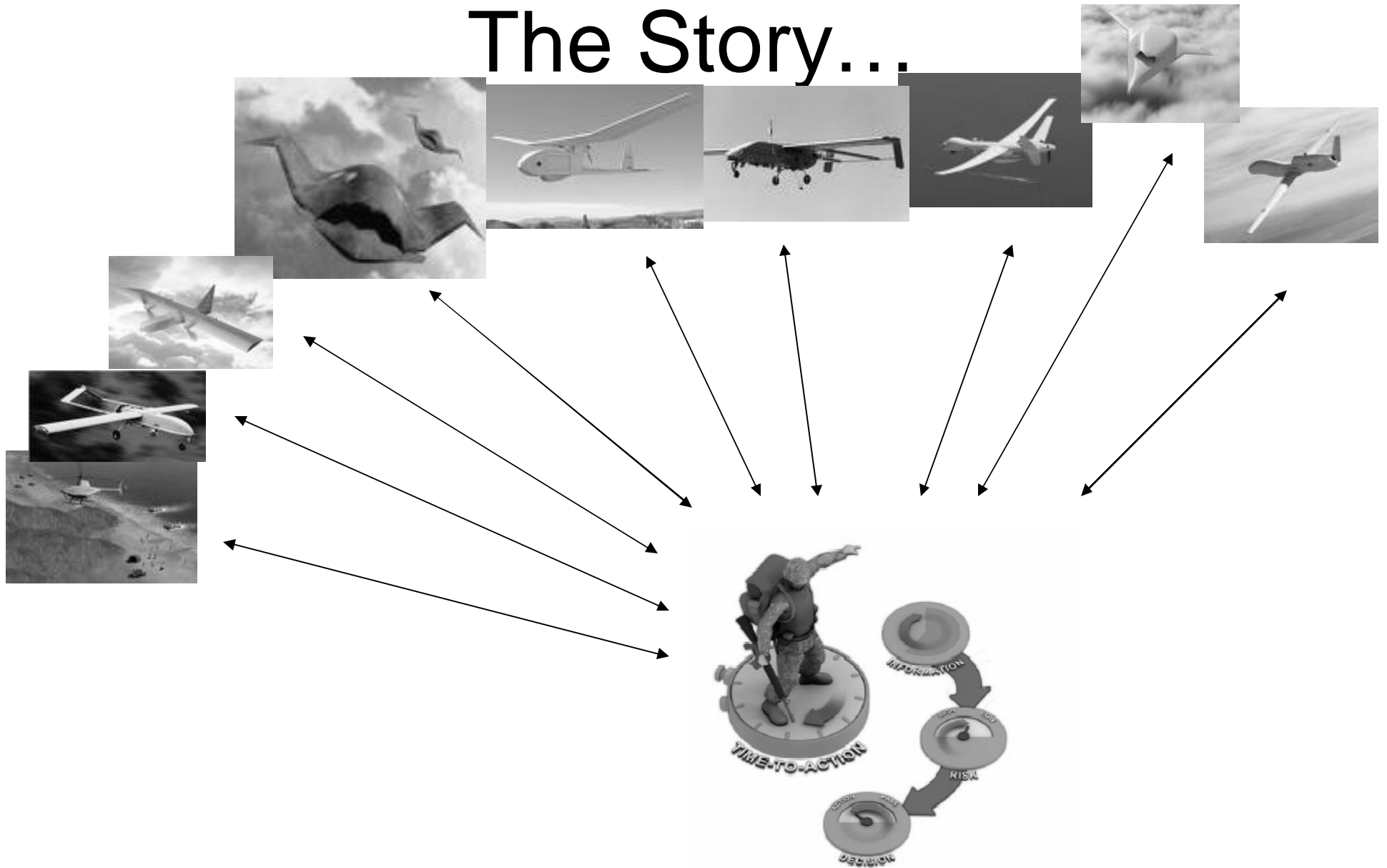


Copy to:
Commanding General, Marine Corps Systems Command
Commander, Joint Unmanned Aircraft System Center of Excellence

MRB Study Tasking

- Research Standards Related to UAS Data Flow
 - Data Link/Comms
 - Sensor Data/FMV
- Conduct Case Studies
 - Representative Set of UAS
- Perform Analysis
 - Data Flow Assessment / Standards Compliance/Value/Risk
- Make Recommendations
 - Standards-related interoperability improvements

The Story...



Interoperability

- Technology makes it possible
- Warriors make it happen

People targets

- DC CD&I, LtCol Jay Mullin 703-784-6604
- N-88, LtCol Ralph McCREary (703) 614-2639
- HQMC, Major “Muddy” Kerr 703-693-2525
- MCSC, Major George Ehlers 703-432-4041 & Mr. Larry Bochenek 703-432-4031
- PMA-263, Major Ben Stinson 301-757-5866





**11th Annual NDIA Expeditionary
Warfare Conference**
Rear Admiral William Landay III
October 23, 2006

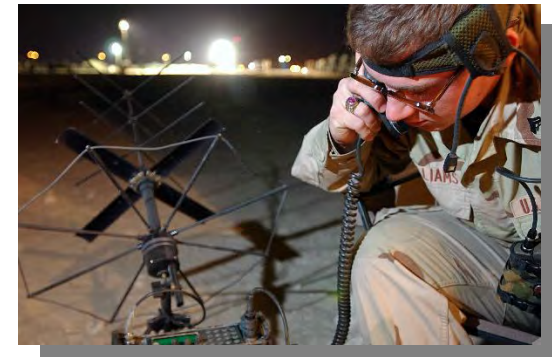


Technological Dominance

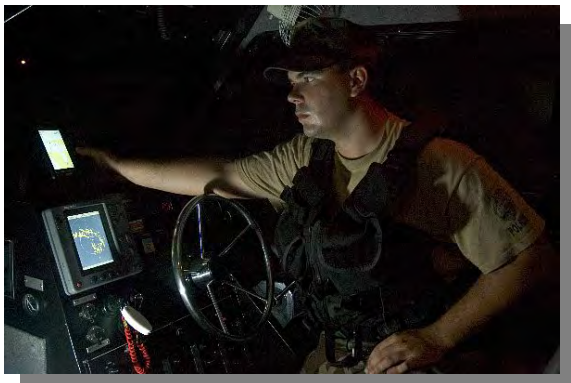


Laser-Guided Munitions

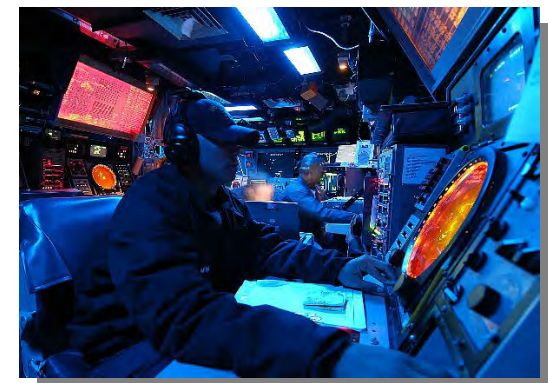
Today, Marines and Sailors have at their disposal the world's most sophisticated military technology



Mobile Communications



GPS Navigation and Targeting



Network-Centricity, Information Warfare, and Intelligence



NR

Technological “Democratization”



**Internet—
Information Warfare
and Intelligence**



**Commercial Laser
Rangefinder—Precise
Targeting**

In the global war on terror and in Iraq, our adversaries are leveraging sophisticated technology that is now easily available anywhere in the world—and at a modest cost.



**Cell Phones—
Mobile Comms**



**Handheld GPS—
Location with
Extreme Accuracy**

**NR**

A Technological “Perfect Storm”?

For decades, Western militaries have held a decisive technological advantage...



“It is by devising new weapons, and above all by scientific leadership, that we shall best cope with the enemy’s superior strength.”

--Winston Churchill

Today, enemies are able to acquire weapons and technology quickly and cheaply...



“Acquiring weapons for the defense of Muslims is a religious duty. If I have indeed acquired these weapons, then I thank God for enabling me to do so. And if I seek to acquire these weapons, I am carrying out a duty. It would be a sin for Muslims not to try to possess the weapons that would prevent the infidels from inflicting harm on Muslims.”

--Osama bin Laden

And there also are adversaries willing to invest significantly in new technology

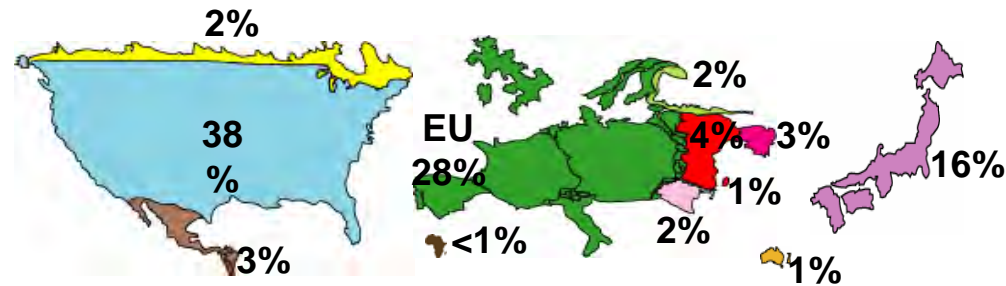


The 21st Century is also going to be an age of scientific change, with certain cutting-edge technologies likely to be applied to naval warfare...high-tech arms will make direct attacks on naval battlefields possible from outer space, remote altitudes and remote land bases...superconduction technology will bring superconductor ships to the naval order of battle, enabling ships to travel faster without noise...submarines will be able to go faster and deeper, with the seabed being the ideal place to build military bases.”

--Chinese Naval Officers at the Navy Research Institute in Beijing

World Science and Technology Investment

1996*



* UIS S&T database; World Bank - PPP data

Asia Share

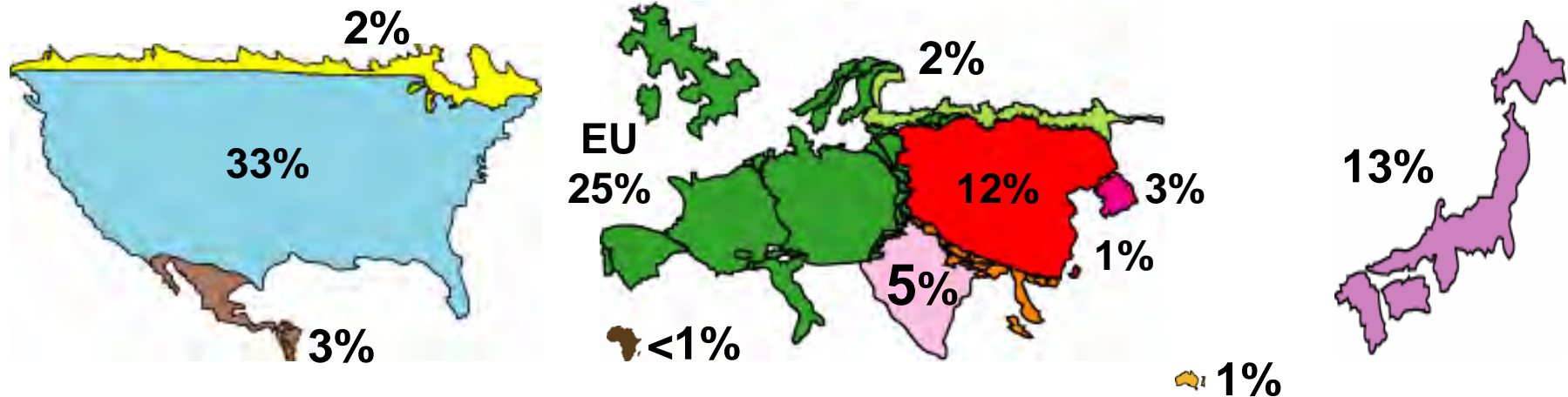
1996: 26%

2004: 35%

Lyons, Mikami 2005, AOARD

+78%

2004**

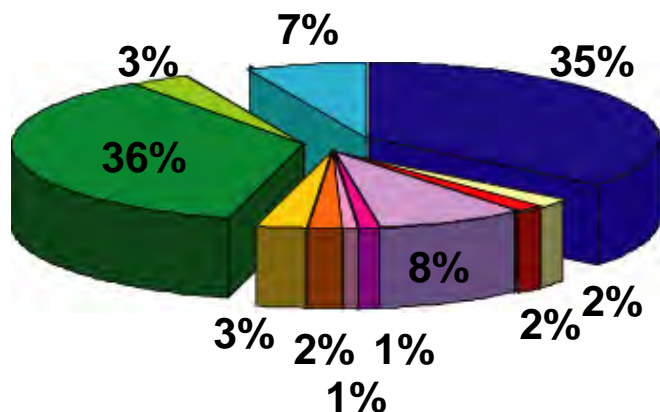


** OECD 2005 PPP; Global S&T Report (Batelle) - PPP data

Lyons, Mikami 2006, AOARD

World Science and Technology Publications

1996

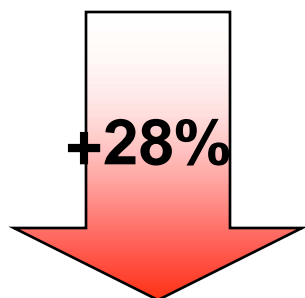


Asia Share

1996: 19%

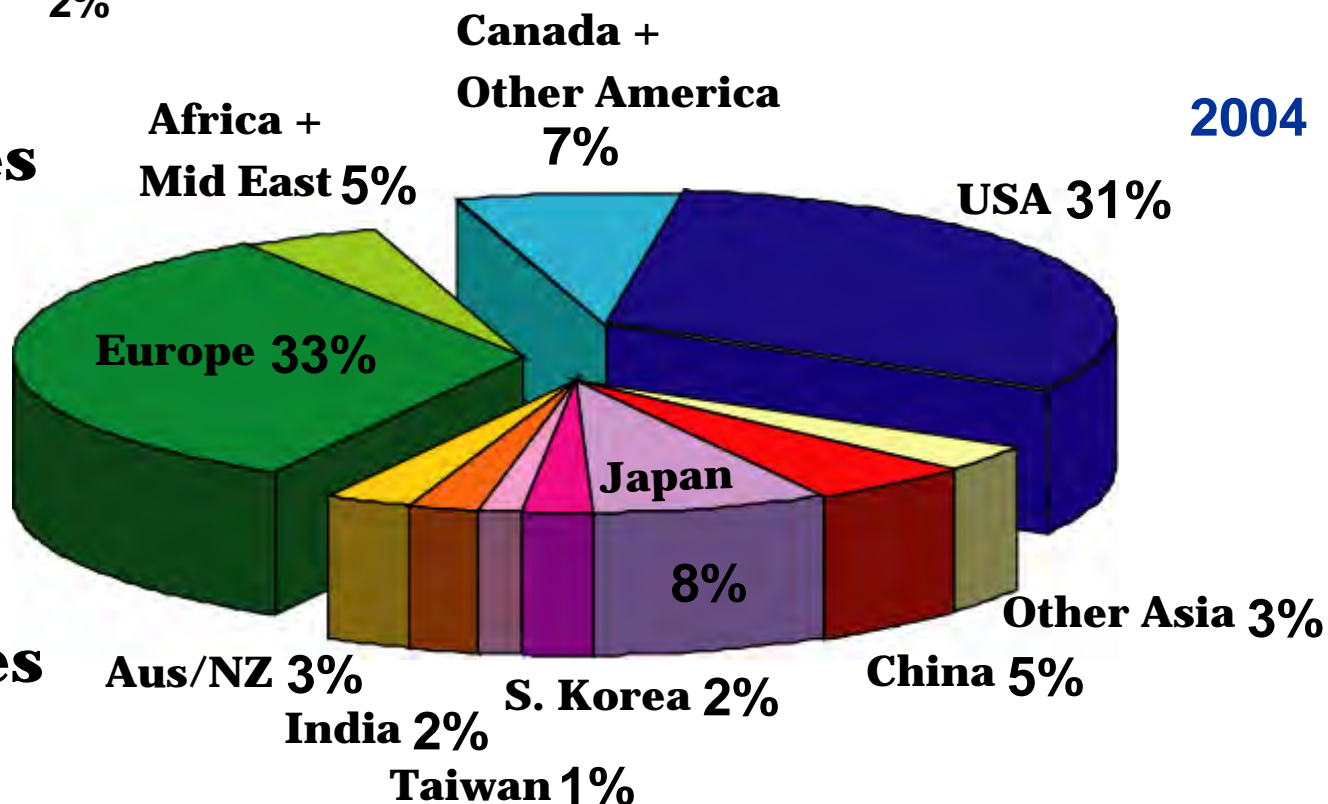
2004: 24%

851,764 articles



1,094,017 articles

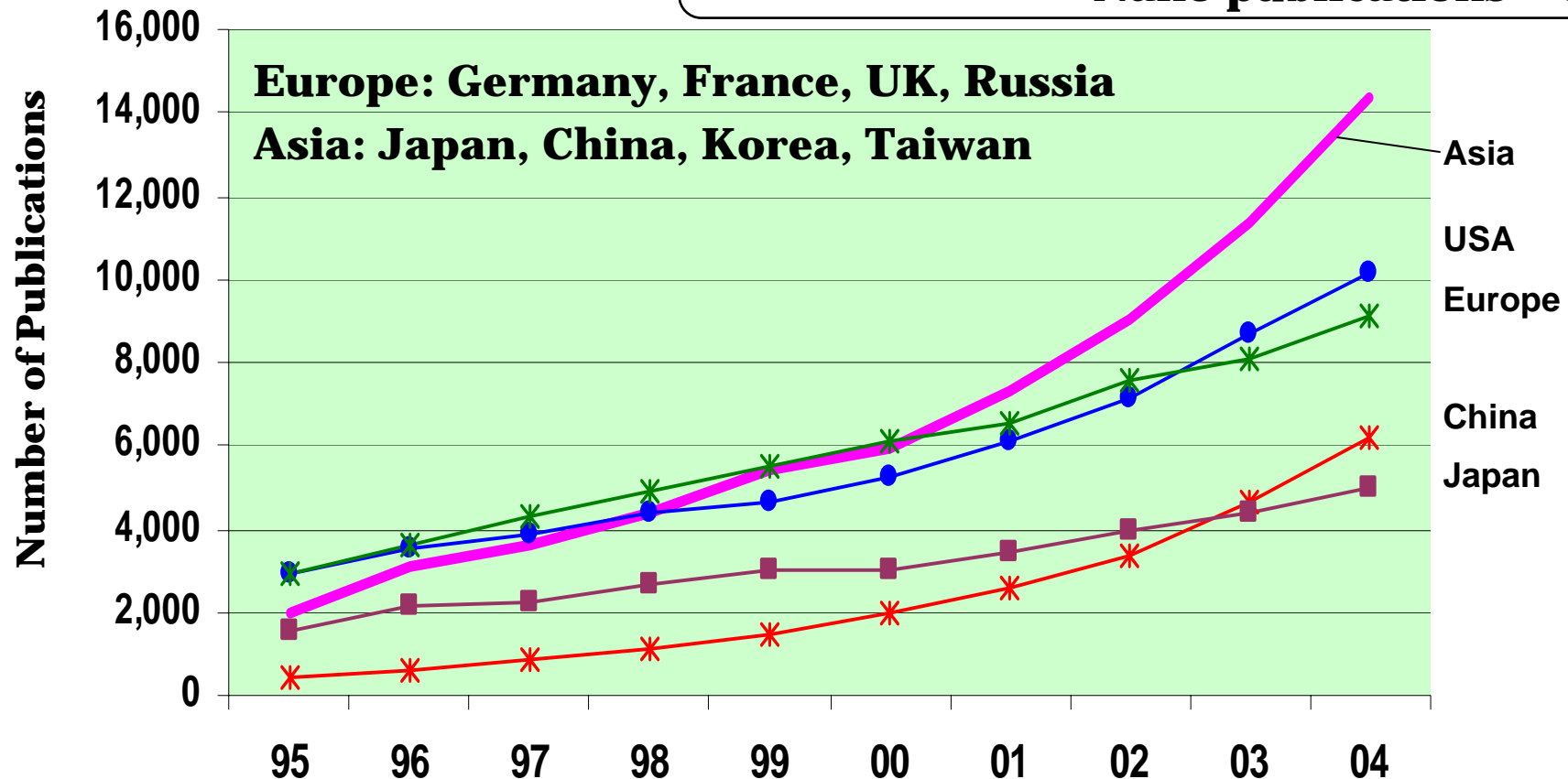
2004





Nanotechnology Publications (1995-2004*)

N-E Asia Share: Overall publication = 16%
Nano publications = 38%



Japan: MEMS, materials & electronics, CNTs, quantum dots/wires, photocatalysis
U.S.: biomaterials, drug design, environmental catalysis, quantum computing

* Data from Science Citation Index, Web of Science, Thomson Scientific; November 2005 (Lyons, Wegener, Hubbard)

What are the key discriminators of U.S. technology?

- Fast movers
- Innovative
- Leading-edge scientists
- Flexible
- Focused on quality



What are the top U.S. technology companies?

HP, IBM, GE, Microsoft, Dell, and Google?



We see these companies operating today in India, China, Russia, and elsewhere in the “developing” world...





A Swiftly Changing Planet



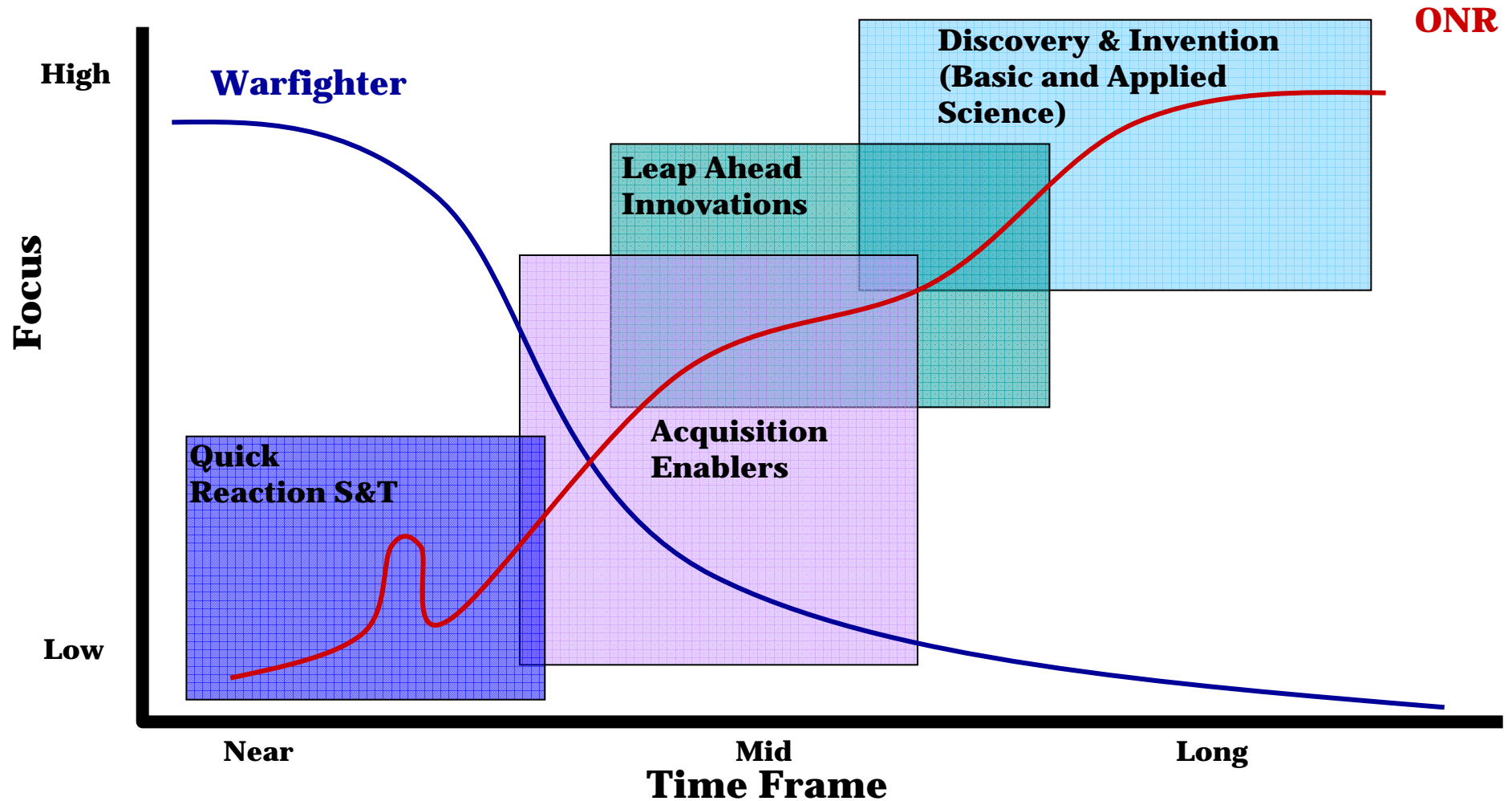
- In an era of increasing globalization, new technology is more readily available—and more quickly—than ever before
- The natures of “combatant” and “weapon” are changing, and new challenges can come from anywhere in the world

- We must accept the fact that adversaries will use our technology against us
- To stay competitive on tomorrow’s battlefields, we must:
 - **Ensure** our people and research enterprises are more innovative
 - **Maintain** our technological advantage





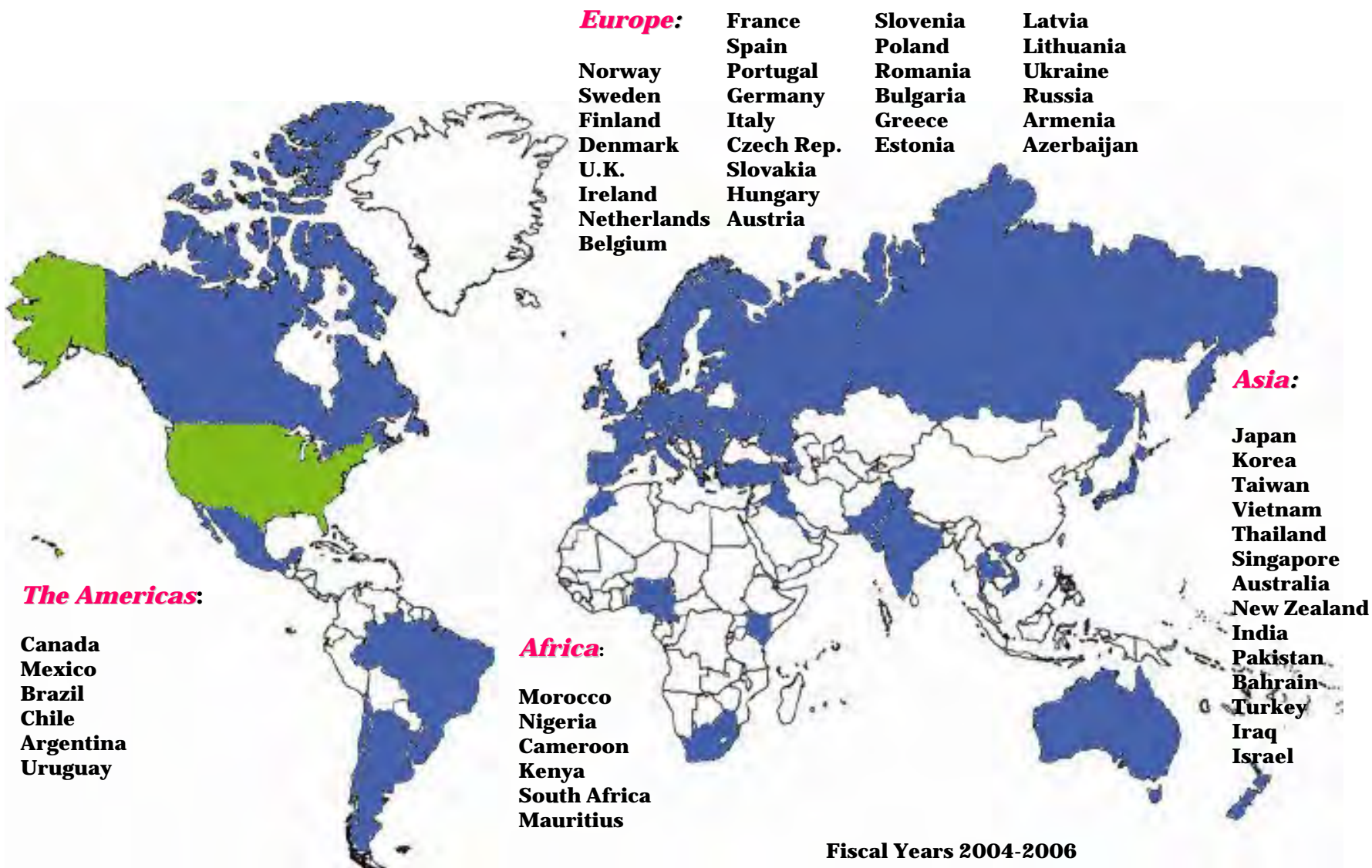
S&T Focus to Meet Naval Needs





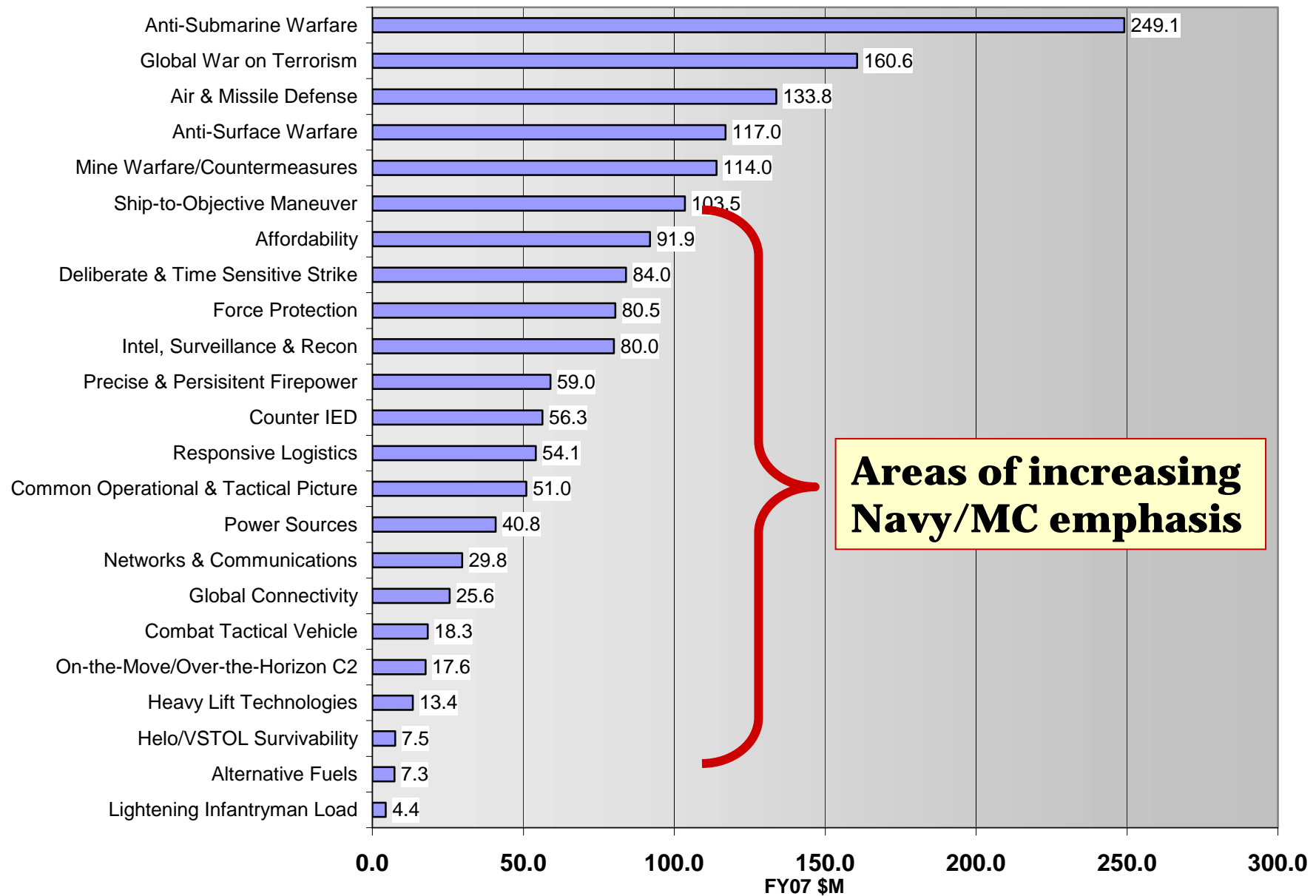
ONR

ONR's International Engagement





Science and Technology Investment by Current Capability Area





Resulting Focus Areas

Naval S&T Focus Areas

Maritime Domain Awareness

Information, Analysis & Communication

Operational Environments

Asymmetric & Irregular Warfare

Distributed Operations

Assure Access & Hold at Risk

Power Projection

Survivability & Self-Defense

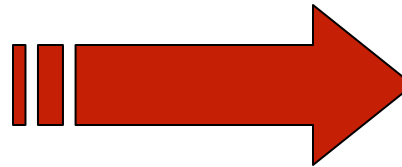
Naval Warrior Performance & Protection

Platform Mobility

Fleet/Force Sustainment

Affordability, Maintainability, & Reliability

Power & Energy



Operational Concepts & Missions

Warfighting & Support Functions

- **Functions that S&T would enable or enhance**
- **Include accepted and projected future functions**



ONR Technology for the Expeditionary Warfighter

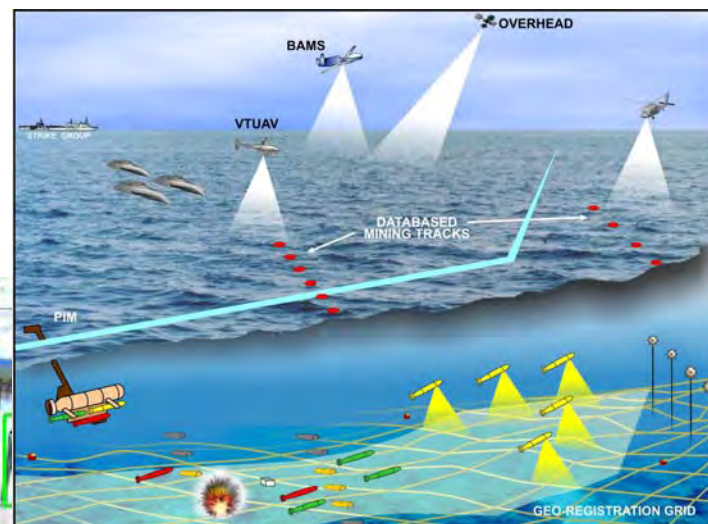
Joint Light Tactical Vehicle: A family of survivable combat vehicles



SpeechGear: Bi-directional Free Speech Language Translation



Visual Understanding Research



Mine Warfare



QuadGuard: Arm and leg protection to protect against blast injuries



NR

Video Understanding Research





ONR Technology for Expeditionary Warfighter Improvement



Dietary Performance Enhancement



VirtuSphere



- Rapidly changing global technology is creating challenges—as well as opportunities—for today's expeditionary warfighter
- ONR is flexible enough to solve today's critical challenges while focusing on tomorrow and the Navy and Marine Corps after Next
- Committed to maintaining our warfighter's superiority to ensure victory on today's as well as tomorrow's battlefields...





Questions?



WWW.ONR.NAVY.MIL



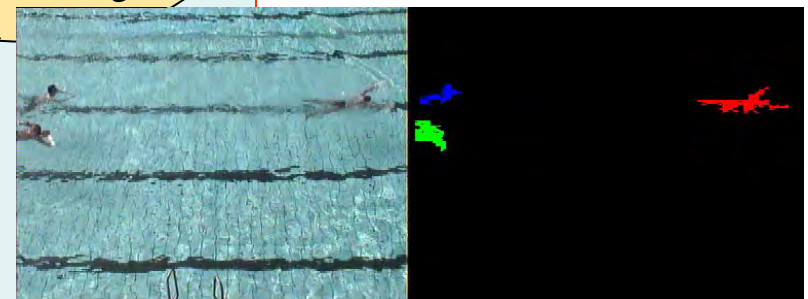
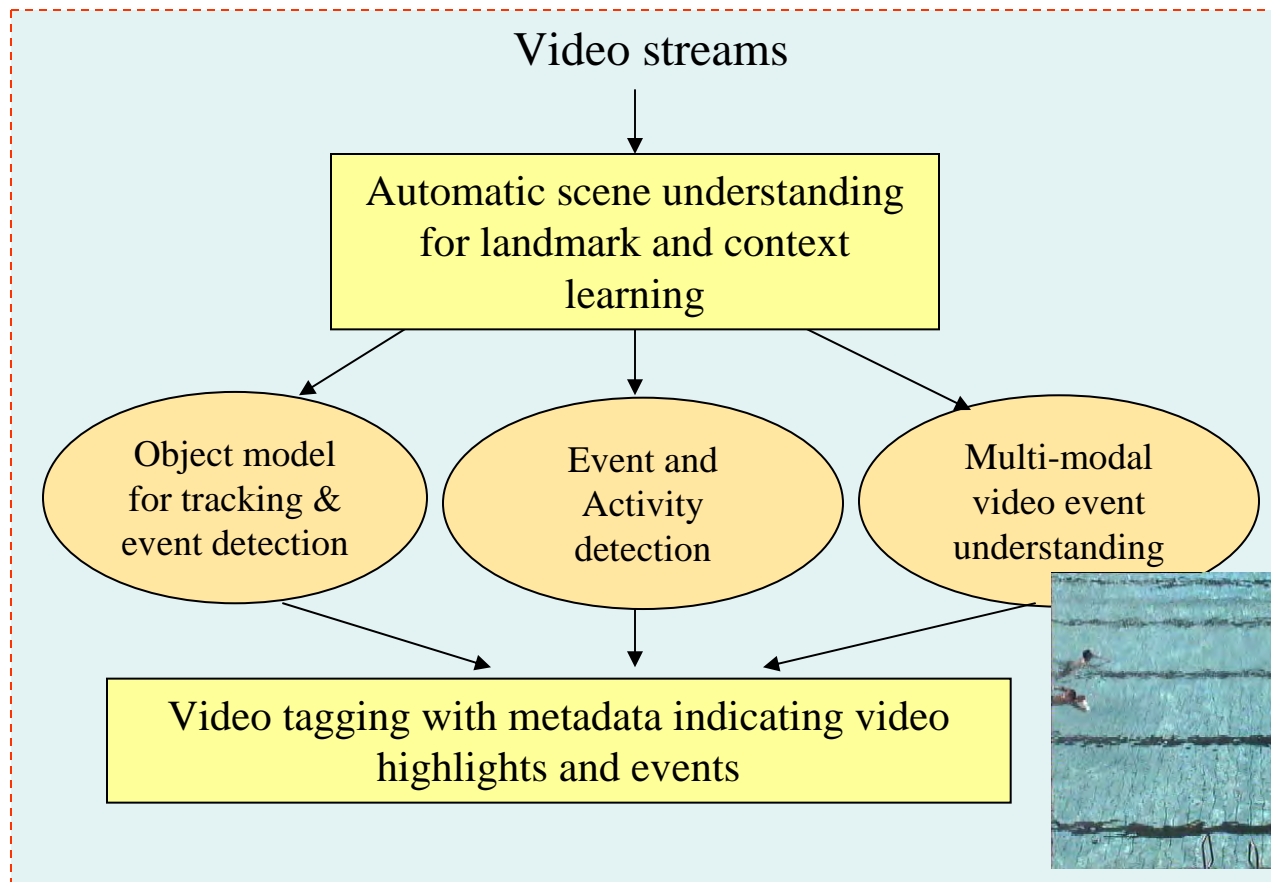
BACK UP



NR

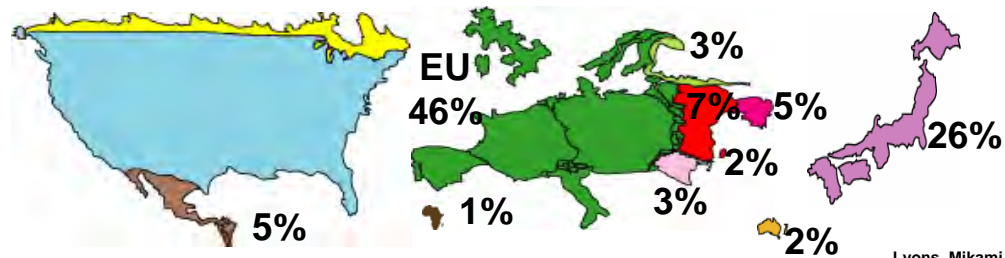
Visual Understanding Research

To develop video understanding technology for real time event detection and easy access of the massive video content by semantic scene understanding, video categorization and concept detection



Non-North American S&T Investment

Normalized without US and Canada



* UIS S&T database; World Bank - PPP data

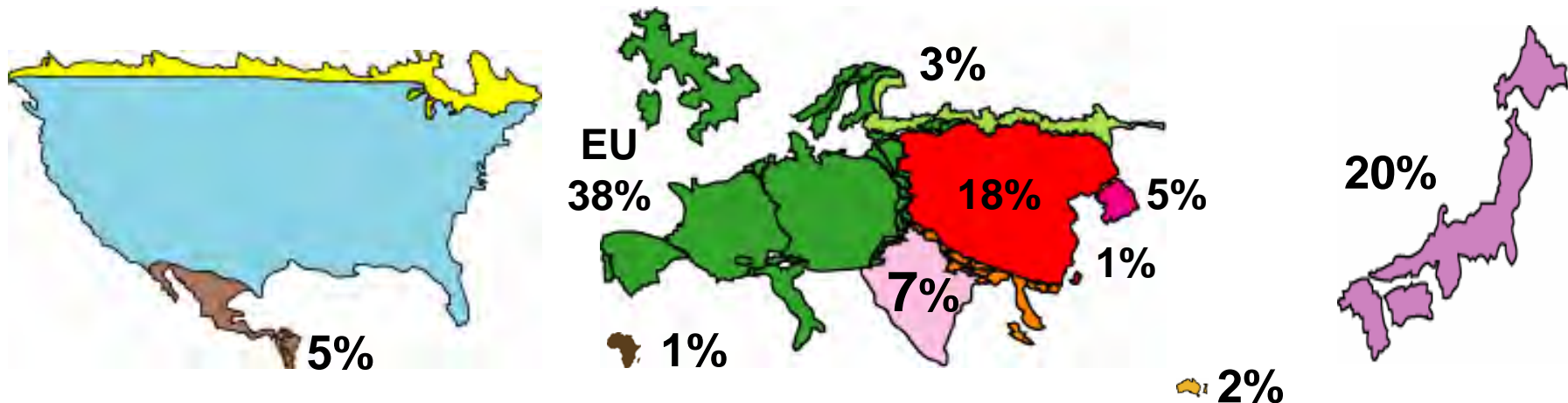
Lyons, Mikami 2005, AOARD

Asia Share

1996: 45%

2004: 53%

+78%



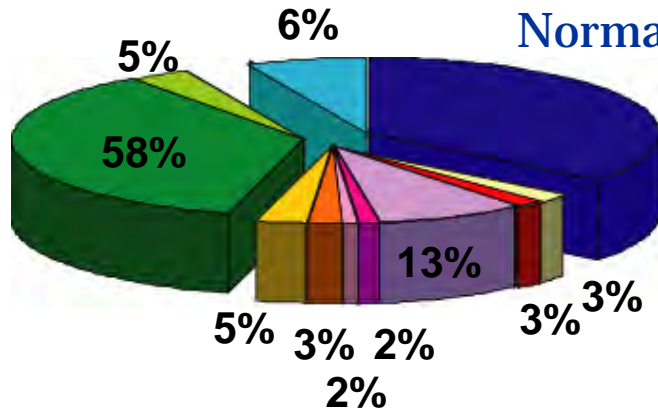
(1996* to 2004)**

** OECD 2005 PPP; Global S&T Report (Batelle) - PPP data

Non-US S+T Publications

(1996 to 2004*)

Normalized without US and Canada

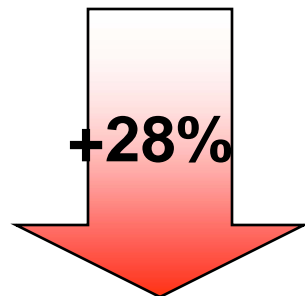


Asia Share

1996: 31%

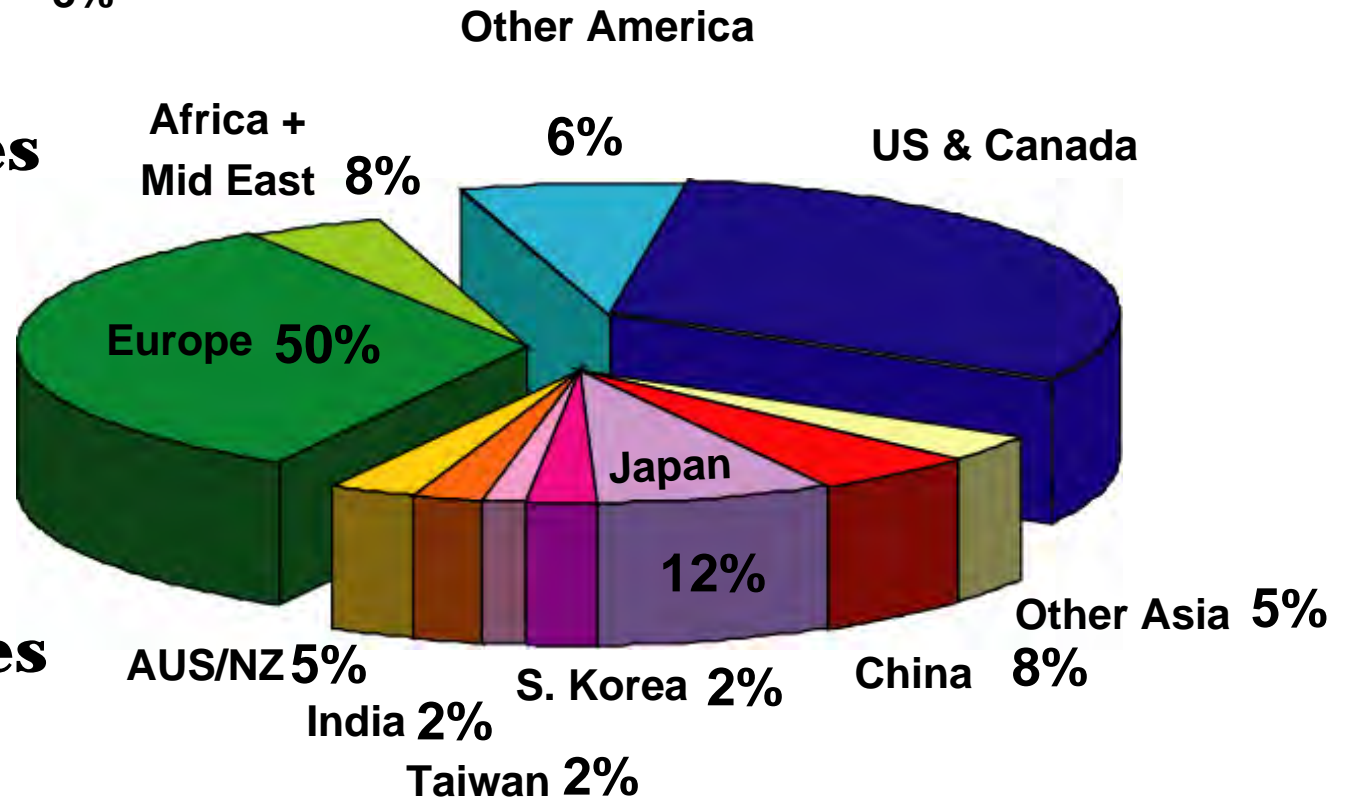
2004: 36%

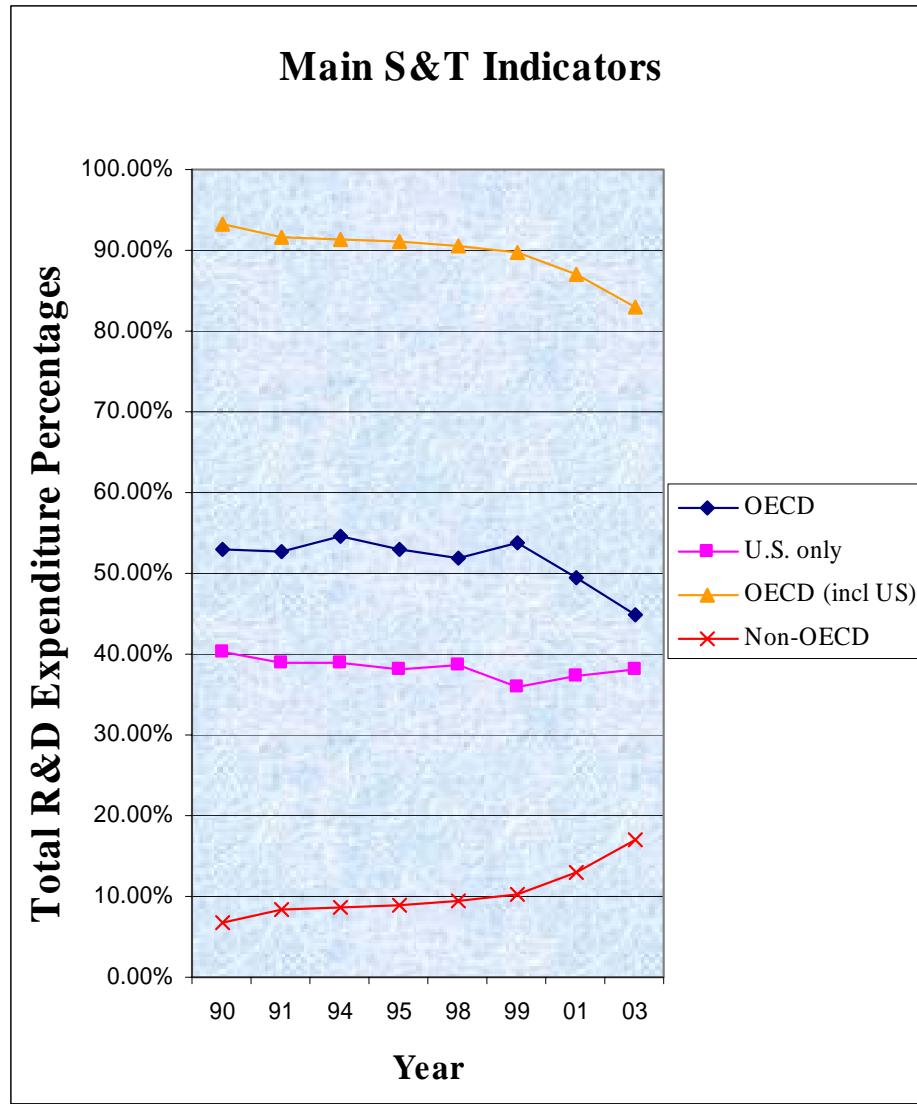
851,764 articles



+28%

1,094,017 articles





**The developing world
is making an
increasingly
significant
contribution to the
total global
investment in R&D**



Joint Light Tactical Vehicle

Trades, Concepts, Technology Demonstrator:

Conduct trade studies, design, build & test a combat science and technology demonstrator platform. Leverage simulation-based design tools.

Superior Mobility/Performance:

State of the art drive train & suspension technologies. Leverage hybrid electric systems from the RST-V, ECASS, and private sector.

Crew station:

Expand on lessons learned from ULTRA to design superior ergonomics, safety and “fightability” of platform.

Advanced Automotive Safety:

Best available safety features to reduce roll-over, collisions and from AugCog platform (autonomous obstacle avoidance system, optical lane sensing, computer stability control).



Advanced Armor Design:

Leverage Army Research Lab ceramic composite and EM armor designs for medium vehicles.

Integrate Active RPG Defense:

Incorporate evolved active net system from current effort.

Integrated Combat Systems:

A “plug & play” ready vehicle that can be quickly adapted to a variety of missions. Power, hard points and crew stations compatible with remote weapons and sensor systems. Leverage Gunslinger and AugCog programs.

Mine/ IED Survivability:

Cab floor and crew seats designed to mitigate shock loading from mines & IEDs.

||| **POTENTIAL THREAT DETECTED** |||

- **RPG-7 :IN FIRING POSITION**





SpeechGear: Bi-directional Free Speech Language Translation

Description

A hand held rugged device to allow dismounted troops to translate bi-directionally from Arabic to English and back

Benefits

- Uses commercial/government off-the-shelf equipment
- Lessens the need for trained translators in field
- Allows for translation of written, visual & spoken language
- Greater than 90% accuracy for in-field translation of free speech





QuadGuard: Arm and Leg Protection to Reduce Blast Injuries



Design philosophy

- Optimizes protection, mobility, weight and comfort
 - Protection against blast fragments and small arms
 - Designed to reduce likelihood of severe injuries
 - NIJ Level IIA protection (NIJ Level II option also available)

Design features

- Protection zones based on anatomical vulnerability
- Flexible joints for mobility
- Vented for comfort
- Integrates with Interceptor vest system
- Arm guard weights
 - 1.6 lbs per arm
- Leg guard weights (including suspenders)
 - 3.1 lbs per leg - open vented design
 - 3.5 lbs per leg - closed vented design
- Volume production cost less than \$1000 per set

Program team

- Funding
 - Office of Naval Research "Tech Solutions" Program
- Design and production
 - Naval Research Laboratory
 - Army Research Laboratory
 - FS Technology
 - Oklahoma State University



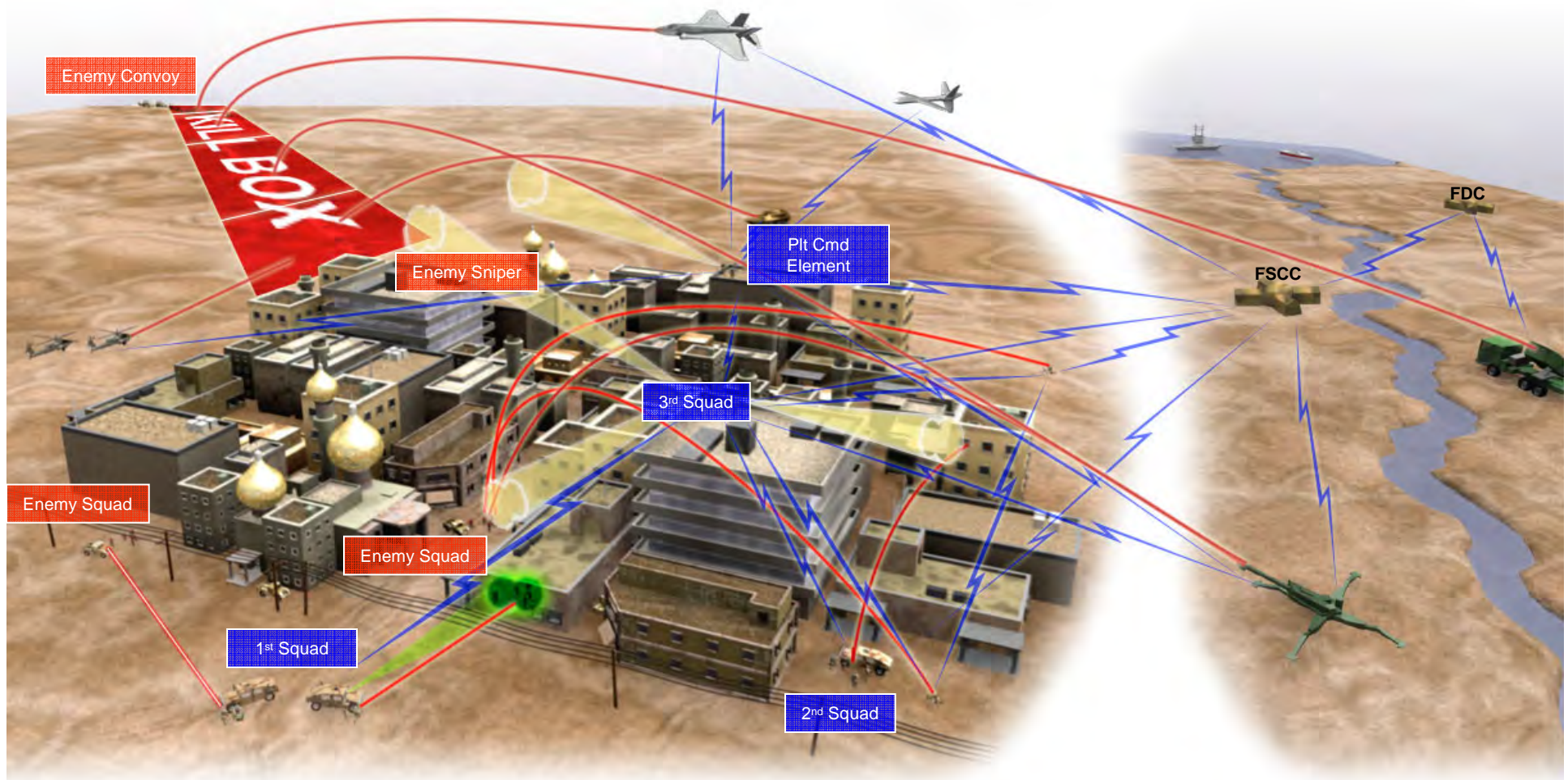


Distributed Operations

DO Tenets

- Enhanced Fires Against Larger Forces
- Increased Unit Separation
- Small Unit Control of Integrated Fires
- Effective in Unique Battlefield Geometries
- Reduced Weight

Simultaneous Distributed Ops



DO Operational Environment



ONR Technology for Expeditionary Warfighter Improvement



Computer Training
Testing Combat Decision-Making Skills



Dietary Performance Enhancement



VirtuSphere



Blue Screen Simulator
Virtual Reality Training for the Aviator



Fatigue and Stress Management

Aviation Update



MG Virgil L. Packett II
Commanding General
U.S. Army Aviation Warfighting Center

Agenda



- **Core Missions**
- **Operational Tempo**
- **Bridging Strategies**
 - **Simulations**
 - **Unmanned Aircraft Systems**

Army Aviation
Above the Best!



Continuing to Execute Our Core Missions

- ✓ Reconnaissance
- ✓ Close Combat Attack
- ✓ Air Assault
- ✓ Sustainment
- ✓ C2
- ✓ MEDEVAC
- ✓ Convoy Escort
- ✓ Manned/Unmanned Teaming

Joint/Combined Battlespace

Army Fleet in OEF

162,000+ Total Hours:
Feb 03 – Oct 06

AH-64 (24)

53,930 Hours
MC: 83%
OPTEMPO: 54.0



(50) UH-60

45,808 Hours
MC: 83%
OPTEMPO: 54.0



CH-47 (28)

44,911 Hours
MC: 72%
OPTEMPO: 52.3



(4) Fixed Wing

9,844 Hours
MC: 77%
OPTEMPO: 50.4



UAS (7 Raven – 1 Shadow)

1,107 Hours



(0) OH-58*

3,413 Hours
MC: 83%
OPTEMPO: 48.3



* No OH-58 units in this rotation

High OPTEMPO and Modular Application

Units not reported this month:
UAS Ravens

Army Fleet in OIF

1.2 Million Total Hours:
Feb 03 – Oct 06

AH-64 (144)
238,793 Hours
MC: 84%
OPTEMPO: 39.0



(316) UH-60
396,359 Hours
MC: 87%
OPTEMPO: 48.4



CH-47 (38)
62,434 Hours
MC: 76%
OPTEMPO: 43.0



(28) Fixed Wing
63,641 Hours
MC: 89%
OPTEMPO: 49.4



OH-58 (60)
222,709 Hours
MC: 83%
OPTEMPO: 65.8



(216) UAS
(15) Shadow 102,440 hrs
(1) Hunter 15,580 hrs
(1) I-GNAT 11,820 hrs
(199) Raven 21,275 hrs
151,115 Hours



High OPTEMPO and Modular Application

Units not reported this month: OH-58



Bridging Simulations



Aviation Warfighting Simulation Center

Aviation Training Exercise (ATX)

- ☐ Conducted 42 since 1997
- ☐ Seven (7) scheduled this FY
- ☐ 36th CAB Vignette



Simulations – More than it appears

Bridging Unmanned Aircraft Systems (UAS)



- ✓ Training Mission
- ✓ UAS Center of Excellence
- ✓ New Systems/Skill Sets
- ✓ Integrating Aviation Discipline

Untapped Potential



Aviation Update



MG Virgil L. Packett II
Commanding General
U.S. Army Aviation Warfighting Center

Aviation Update--PCB



1



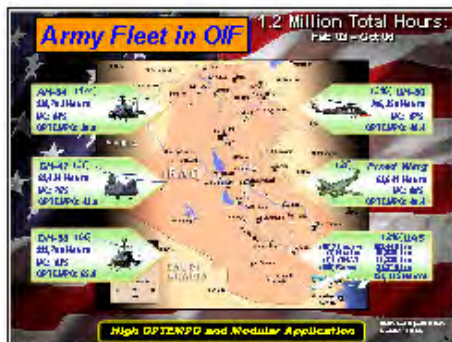
2



3



4



5



6



7



8



UNCLASSIFIED

Navy Expeditionary Combat Command



CAPT John Sturges
Commander Naval Coastal Warfare Group ONE
25 October 2006



UNCLASSIFIED

NECC Value

- ***Properly align:***
 - *Title 10 functions*
 - *Warfighting C2*
 - *Resource management*
- ***Realigns current disparate force structure***
- ***Creates process for irregular warfare development***
- ***Capitalizes on synergies of current expeditionary force***
- ***Integrates man, train, and equip functions of distributed expeditionary warfare capabilities***
- ***Optimizes adaptive force packaging and force closure time***

Enterprise Approach to Expeditionary Warfighter Readiness



UNCLASSIFIED

Navy Expeditionary Combat Command

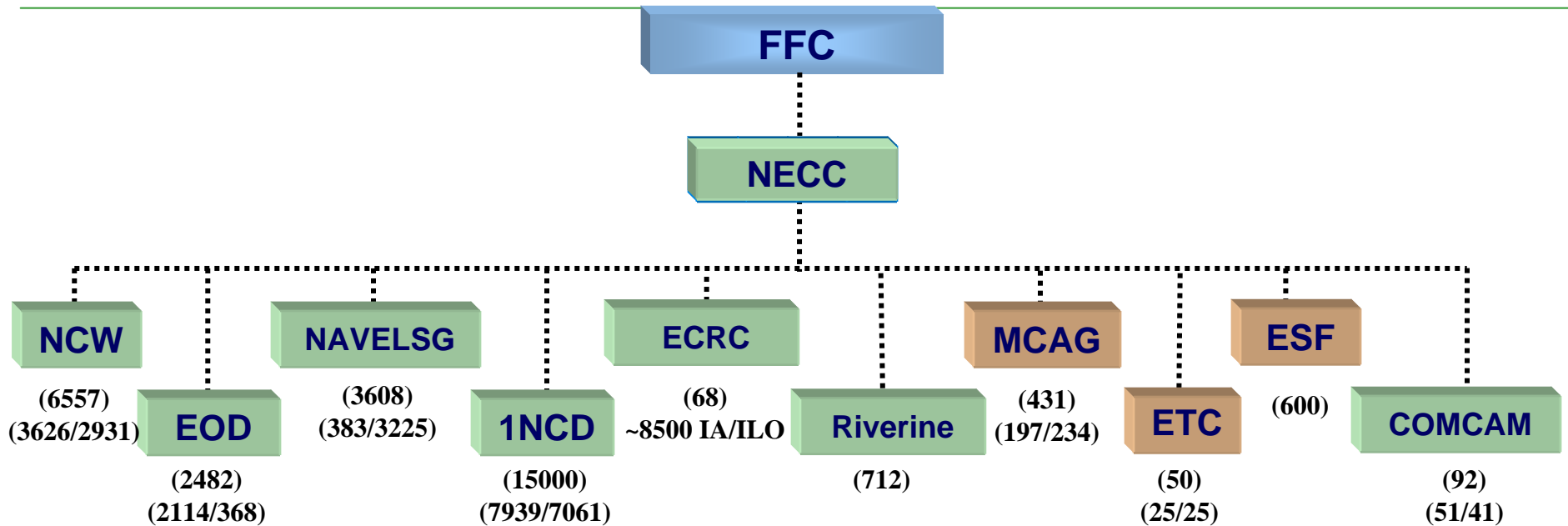
Vision

- *Prepare ready task organized combat support and combat service support force packages;*
- *Aligned to be effective, flexible, and responsive to COCOM demands;*
- *Ensuring expeditionary forces have sufficient capability and capacity to meet requirements for Major Combat Operations, the Global War on Terrorism and Home Land Defense; while*
- *Maintaining a solid foundation of core capabilities that can respond rapidly to evolving irregular warfare missions*



UNCLASSIFIED

NECC Forces



Naval Coastal Warfare (NCW)

Explosive Ordnance Disposal (EOD)

- Weapon Exploitation (incl' IED & WMD)

Navy Expeditionary Logistics Support Group (NAVELSG)

FIRST Naval Construction Division(1NCD)

Current capabilities

Future capabilities

Expeditionary Combat Readiness Center (ECRC)

Maritime Civil Affairs Group (MCAG)

Expeditionary Training Command (ETC)

Expeditionary Security Force (ESF)

- Intelligence

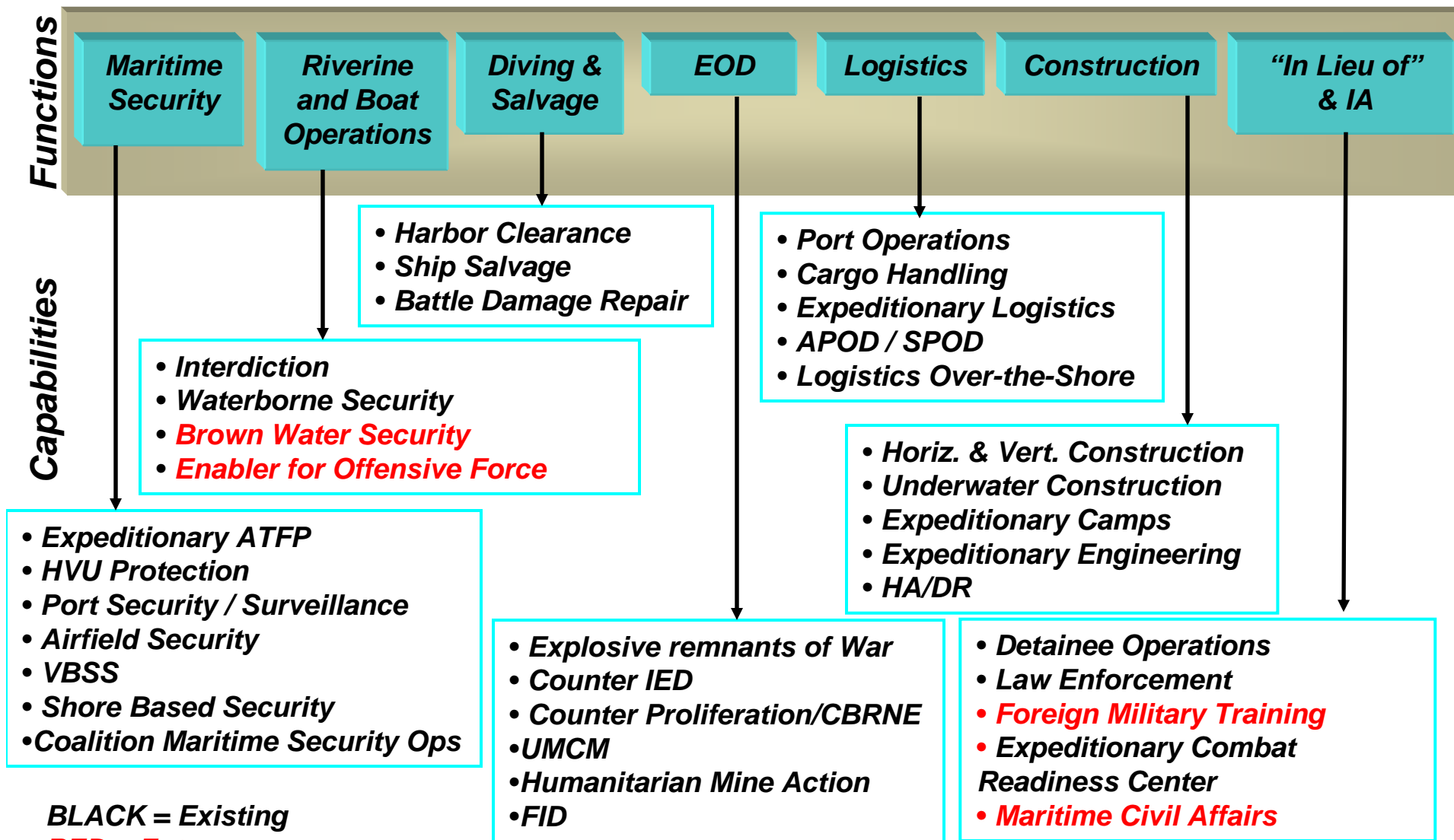
- VBSS

NECC Combat Camera Det LANT (COMCAM)



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Maritime Functions and Capabilities



BLACK = Existing

RED = Future



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NECC Battlespace

Adaptive, Expeditionary, Rheostat Capacity





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NECC Challenges

- *Force Synergy... Operate in Joint/Combined environment*
- *Battlespace Command and Control*
- *Sensors*
- *Weapons... Non Lethal and Lethal*
- *Boats and Vehicles*
- *Countering Evolving Asymmetric Threat*



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Questions



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BACKUP SLIDES



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Naval Coastal Warfare

- **Mission:**
 - Seaward surveillance and security forces in amphibious objective areas, harbors, anchorages and other militarily significant inshore areas throughout the world.
 - C4I support to deployed operational commanders.
- **Description: 6 RC + 2 AC Squadrons Fielding:**
 - Naval Coastal Warfare Squadrons w/ embedded C4I Dets and Mobile Ashore Support Terminal C4I suite
 - Mobile Inshore Undersea Warfare Units with mobile surveillance and communications equipment
 - Inshore Boat Units with high speed craft, armed
 - World-wide deployable in response to emergent AT/FP requirements or OPLAN support
 - Force packages tailored to minimize footprint and provide specific operational capabilities

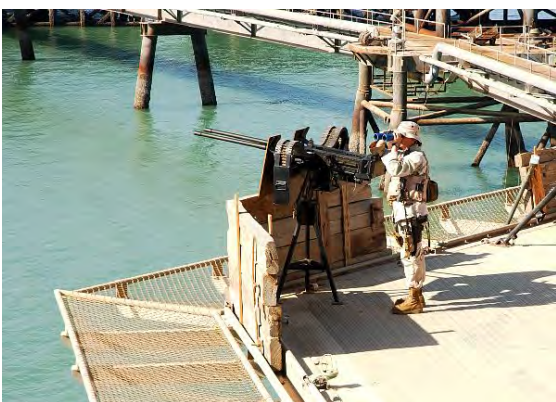




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Mobile Security Squadrons

- **Mission:**
 - **Provide light, MOBILE, INPORT SHORT-TERM POINT DEFENSE** for US ships, aircraft, and other DoD high value assets (HVA) against terrorist attacks in locations where U.S. shore infrastructure does not exist or requires augmentation.
 - **CONUS USN installation security augmentation or support for maritime homeland security (HLS) in non-Navy ports.**
 - **World-wide deployable in response to emergent AT/FP requirements or as pre-planned AT/FP measures**





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Navy Expeditionary Logistics Support Group

Navy Cargo Handling Battalion

NCHB (1 AC / 10 RC)

- Offload MPS, MSC or commercial ships
- Discharge / load cargo, ammunition, HAZMAT pierside / instream
- Conduct port terminal operations, perform heavy lift crane operations
- Operate limited expeditionary ocean terminal
- Provide short-haul trucking

Navy Air Cargo Handling Battalion

NACHB (1 RC)

- Operate an Air Terminal Operations Center (ATOC)
- Load / offload air cargo, sort, prioritize and prepare documentation, certify HAZMAT for air shipment
- Monitor, report, and manifest passengers

Navy Ordnance Reporting and Handling Battalion

NORHB (1 RC)

- Receive, stage, issue and prepare ordnance for shipment
- Provide inventory management of ordnance via ROLMS





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Navy Expeditionary Logistics Support Group

Navy Supply Support Battalion

NSSB (2 RC)

- *Receive, process, store and transship freight*
- *Process and distribute mail both bulk and retail*
- *Operate aircraft and ground support refueling and bulk fuels storage*
- *Provide non-tactical logistics information connectivity*
- *Provide messing / berthing assistance*
- *Provide maintenance of CESE, MHE and GSE*
- *Provide contingency acquisition contracting*
- *Receive, ship and track depot level repairables*



Navy Expeditionary Logistics Response

Center

NELRC (1 RC)

- *Provide deployable logistics management cell to support Navy Component Commander*
- *Monitor theater logistics*
- *Coordinate support forces ashore and inter-theater logistics*
- *Support logistics planning and exercises*





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FIRST Naval Construction Division



Naval Construction Division / Regiment

NCD (1 integrated AC-RC)

NCR (2 AC / 4 RC)

- Command and control element

Naval Mobile Construction Battalion

NMCB (8 AC / 12 RC)

- Forward Operating Base / camp construction
- Defensive positions, tower, bunker, and entry control point construction
- Main Supply Route construction and maintenance
- Bridge construction
- Airfield construction
- Ammo supply point construction
- Enemy Prisoner of War camp construction
- Utilities construction/maintenance (electrical, plumbing, heating, air conditioning)
- Water well drilling
- Rapid runway/airfield damage repair
- Disaster recovery operations
- Building construction





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FIRST Naval Construction Division



Construction Battalion Maintenance Unit

- CBMU (2 integrated AC-RC)
- Fleet hospital set-up / operation / maintenance
- Forward Operating Base & camp operation/maintenance/limited construction

Underwater Construction Team

- UCT (2 AC)
- Construction and installation of fleet moorings
- Pier/wharf damage assessment / repair
- Underwater pipeline inspection / repair
- Underwater blasting/obstacle clearing
- Underwater cable laying
- Bathymetric surveying

Naval Construction Force Support Unit

- NCFSU (1 RC)
- Transport of construction materials
- Quarrying, rock crushing, asphalt / concrete production
- Electrical transmission line construction support

Seabee Readiness Group

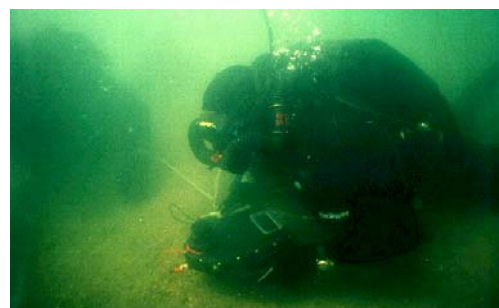
- SRG (2 integrated AC-RC)
- Provide military and technical training for NCF units





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Explosive Ordnance Disposal



- **Fleet Support**
 - **CSG, ESG, Shore Stations**
- **Force Protection**
 - **WMD, IED, UXO, Mines**
 - **U.S. Secret Service and DOS VIP protection**
 - **Contingency Swimmer Defense Marine Mammal Systems**
- **Mine Countermeasures**
 - **VSW, Organic, Dedicated UMCM**
 - **Contingency Marine Mammal Systems**
- **Special Operations**
 - **WMD (CBRNE), Booby Trap, IED, Mines**
 - **SOF integration/support**





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Mobile Diving and Salvage



Fleet Support

- Limited U/W Ships Husbandry
- Force Protection dive support of ships in port and piers.
- Area search unmanned underwater vehicle (UUV) program lead



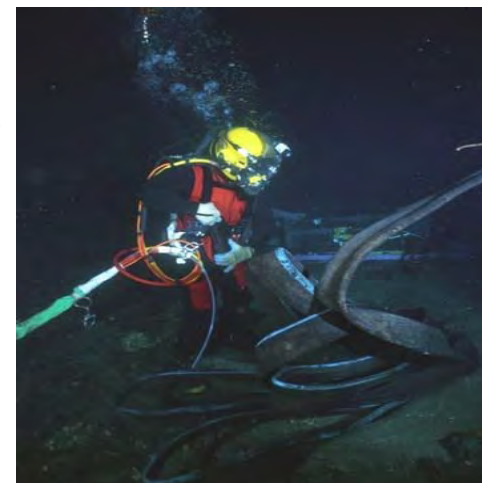
Expeditionary Salvage

- Ashore/Afloat capability for search and recovery
- Surface supplied/SCUBA
- Fly-away mixed gas dive system for deep/long duration dive capability.



Harbor Clearance

- Full spectrum salvage/debeaching
- Underwater cutting/welding
- Limited demolition





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Riverine Force

Riverine operations require forces organized to exploit the unique characteristics of river environments. They are conducted to:

- ***Establish and maintain control of rivers and other waterways for military and civil purposes***
- ***Deny use of rivers/waterways to waterborne and immediate shore sited hostile forces by:***
 - ***Surveillance operations***
 - ***Barrier operations***
 - ***Interdiction operations***
- ***Locate / destroy waterborne hostile forces***





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Maritime Civil Affairs Group

- ***USA/SOCOM mission has full CA***
 - ***Acknowledges USA/SOCOM expanding CA force***
- ***Focus on Civil Military Operations (CMO)***
 - ***Augments USA/USMC/SOCOM capability***
- ***Create small “bolt-on” tactical teams***
 - ***Aligns well with COCOM demand signal***
- ***Allows for near-immediate response capability***
- ***Focus on JFMCC battle-space***
 - ***Theater Security Cooperation Plan***
 - ***Influence / Shaping Operations (Phase 0 Operations)***
 - ***HA / DR Operations***
 - ***GWOT Enablement***



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Expeditionary Training Command

- *“Sea Shaping” concept for JFMCC portion of COCOM Theater Security Cooperation Plan(s)*
- *Provide capabilities-based/task-organized Adaptive Force Training packages*
- *NECC leads*
 - *Liaison with NCCs to identify/clarify COCOM requirement*
 - *Coordinate with Navy Education and Training Security Assistance Field Activity (NETSAFA)*
 - *Identify and build adaptive force packages*
 - *Assumes access Navy forces beyond Fleet (e.g. medical, legal, etc)*
 - *Operationalizes partner opportunities*
 - *USCG - International Training Division*
 - *USMC – Foreign Mission Training Unit*
 - *Others?*

Adaptive Capability to Deploy Expeditionary Training Teams



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Expeditionary Security Force

- ***Vision to align NECC security forces with NCW to create multi-mission, expeditionary-capable force***
- ***Employ tailored/scalable force packages in JFMCC battle space***
 - ***Point and area security across range of operational environments including: near coast, riparian, and fixed sites***
 - ***Responsive and flexible to JFMCC and base commander needs***
 - ***Embedded Intelligence Exploitation Teams and VBSS Level III Teams***
- ***Foundational structure to attract, train/develop, retain Sailors within a recognizable warfare area***



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Expeditionary Combat Readiness Center

- ***Train, equip, certify, deploy, provide oversight, reach-back and redeploy Navy Individual Augmentees, in-Lieu-of individuals and provisional units deploying for non-traditional expeditionary missions in support of the Global War on Terrorism***
- ***Align In-Lieu-of personnel into task organized combat support and combat service support force packages***
- ***Increase individual and provisional unit combat readiness by ensuring Navy personnel receive ground combat skills training, and coordinating mission specific training where required***




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Joint Unmanned Aircraft System Center of Excellence


NDIA CONFERENCE

26 Oct 06

Background

- 
- ✍ **Jun 05 – JROC directs creation of two organizations:
JUAV COE and JUAV MRB**
 - ✍ **Sep 05 – JROC approves JUAS COE re-stated mission,
charter, and manpower construct**
 - ✍ **Oct 05 – JUAS COE reaches Initial Operational Capability**
 - ✍ **Nov 05 – JUAS COE Charter formally approved by CJCS**
 - ✍ **Dec 05 – PBD 704: Funding and Manpower Reprogramming**

Vision

- 
- ✍ **Provide the first point of entry for UAS OPERATIONAL issues requiring joint consideration, analysis, and resolution.**
 - ✍ **Harmonize / Optimize operational efforts of the Services, COCOMs, OSD, and agencies/entities.**

“ Joint Lens ” that promotes increased standardization, reduction of overlapping efforts, and resolution of interoperability challenges

Mission Statement

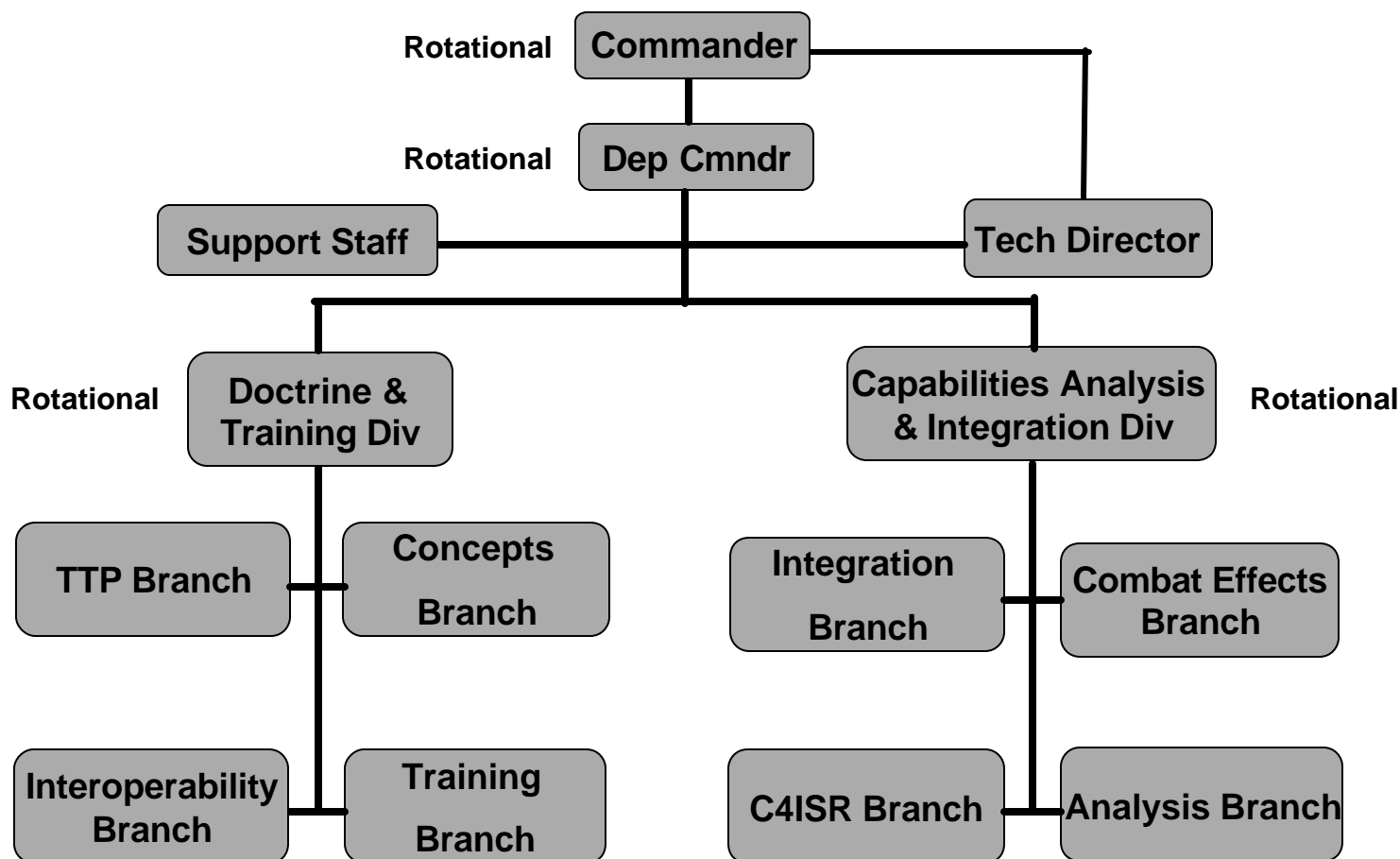


JUAS COE provides support to the Joint Operator and Services by facilitating the development and integration of common unmanned aircraft system operating standards, capabilities, concepts, technologies, doctrine, tactics, techniques, procedures and training.

JUAS COE leverages existing Service initiatives and activities to provide joint integrated solutions and improved interoperability.

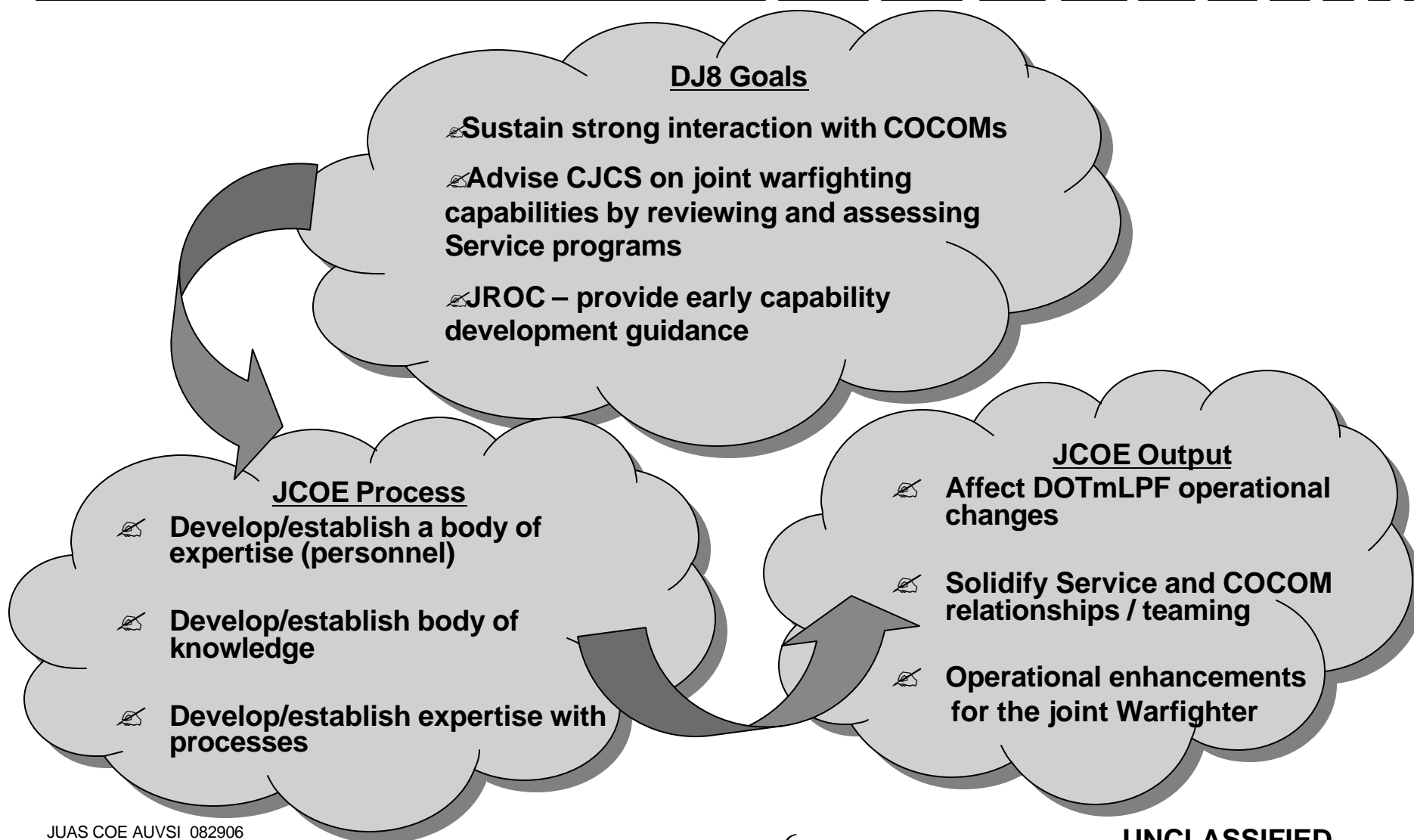
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Organization Framework and Manning










Jointly Manned Activity – 38 Military / 6 CS / 20 Contractors (Core)
Currently in place – 12 Military / 20+ Contractors

Goals and Objectives

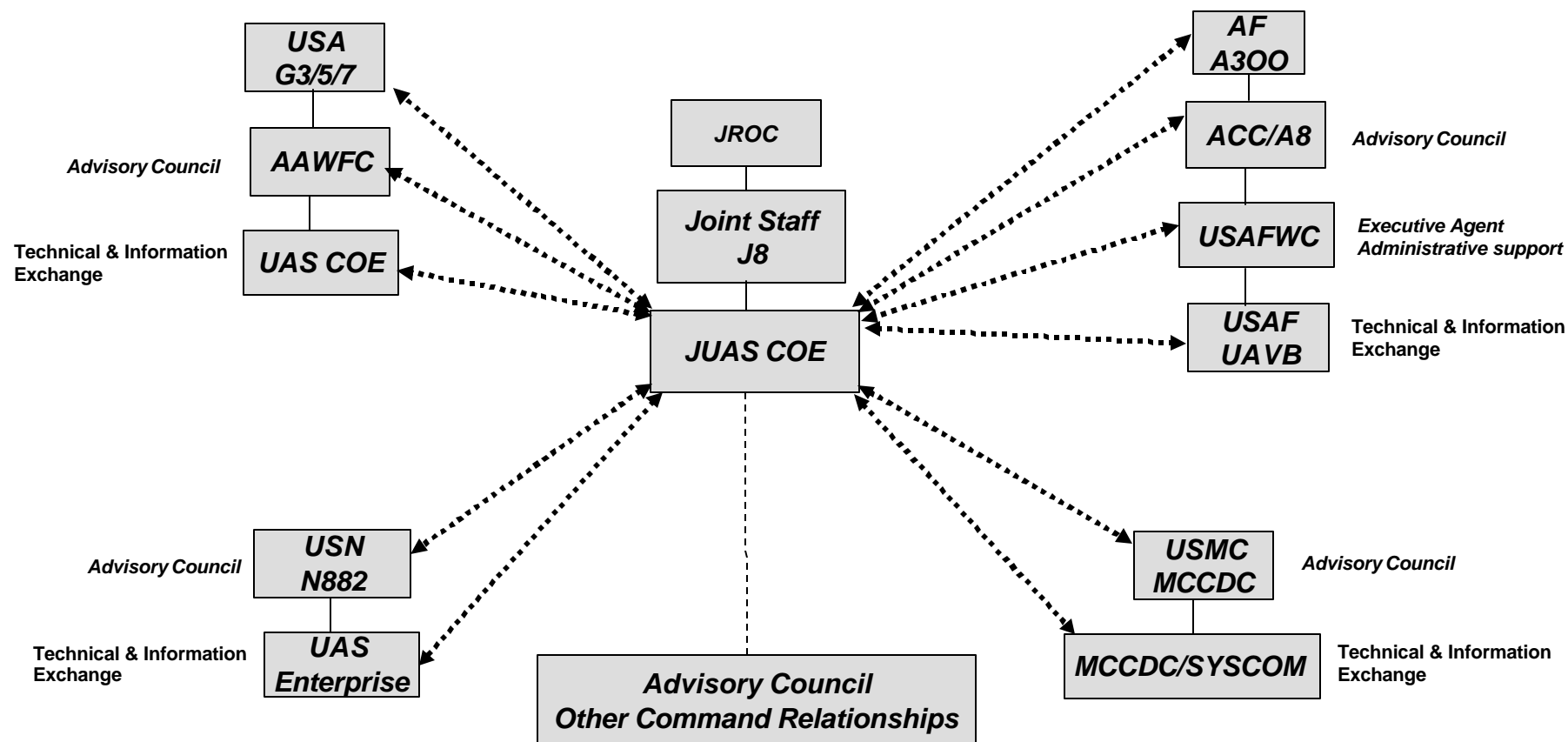


JUAS COE Charter

- 
-  **Develop** Joint CONOPS, TTPs, and doctrine
 -  **Review** service and COCOM capabilities requirement submissions into Joint Capabilities Integration and Development System (JCIDS) process
 -  **Facilitate** integration of UAS capabilities into joint and component training and exercises
 -  **Address** airspace integration, joint command and control, and spectrum management issues
 -  **Coordinate** efforts with the Joint UAS Material Review Board (JUAS MRB)
 -  **Develop** and orchestrate experiments, exercises, and demonstrations

COCOM and service UAS operational requirements and priorities determine JUAS COE work plan

Command Relationships



Advisory Council O-6 level representation from all services and COCOMS

Advisory Council

0-6 Advisory Council

Needs

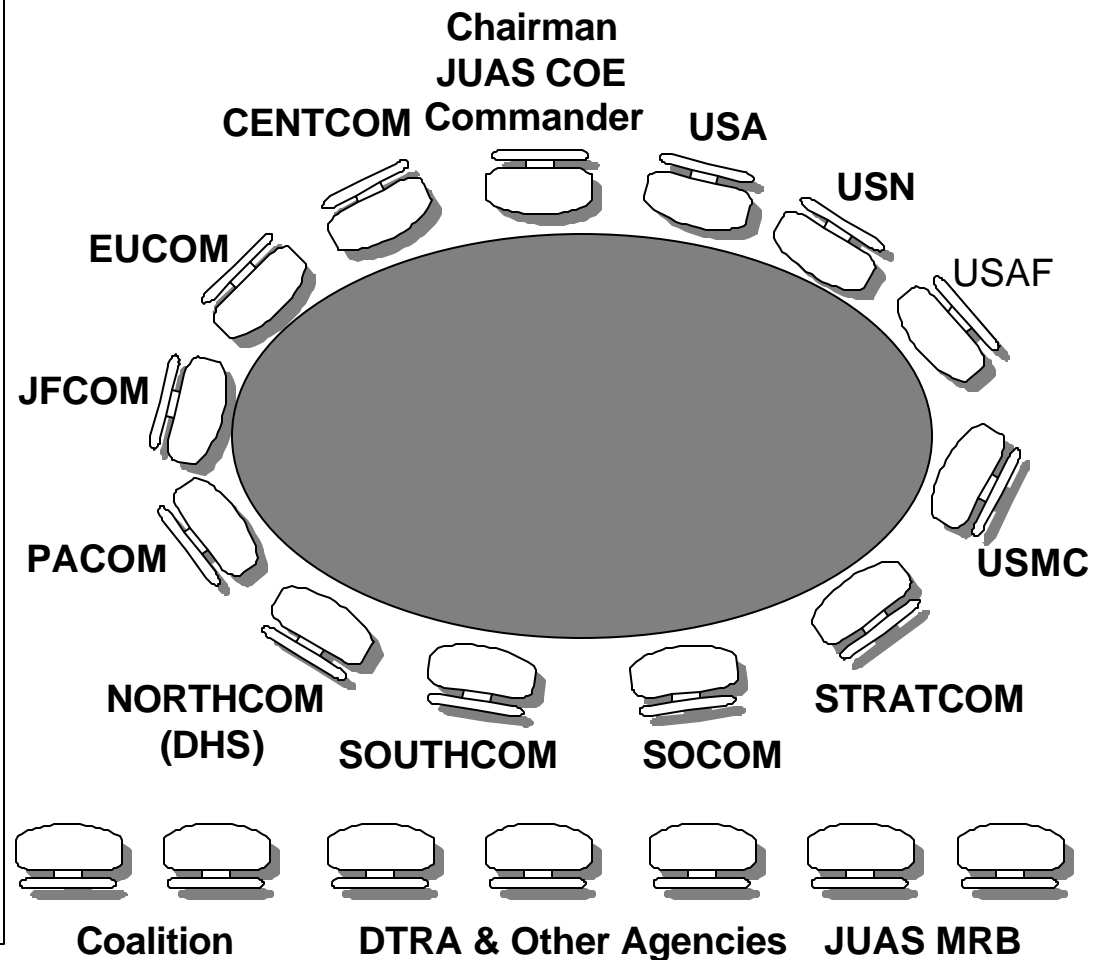
- Bring operational issues to table
- Set a Top 5 or Top 10 list of COCOM issues requiring Joint solutions
- Identify Joint initiatives where the JUAS COE requires assistance or teaming with Service COE/Battlelabs
- Identify Service issues with Joint implications requiring JUAS COE assistance

Solutions

- Identify ongoing activities working solutions to issues
- Monitor progress of ongoing initiatives
- Establish/update recommended list of initiatives for the JUAS COE

Next Meeting

- Nov 06 – SOCOM/CENTCOM - Tampa



Relationship with Material Review Board

MRB Mission

“ Provide a forum to identify or resolve requirements and corresponding material issues....Regarding interoperability and commonality, prioritize potential solutions....”

MRB Goals

- ✍ Facilitate JCIDS...coordinate with and make recommendations to the FCB, JCB, and JROC:**
- ✍ Improve commonality of payloads/GCS**
- ✍ Improve interoperability through adoption of common standards**

MRB Objectives

- ✍ Identify/resolve and/or mitigate materiel issues at the earliest opportunity in the JCIDS process**
- ✍ Coordinate UAS materiel initiatives with the support community**
- ✍ Coordinate government/industry UAS issues**





JUAS COE will provide a non-voting representative to the board and provide representatives to working groups as required

Capabilities, Analysis, Integration Div Update

JROCM 283-05: MQ-1 Orbits Demand

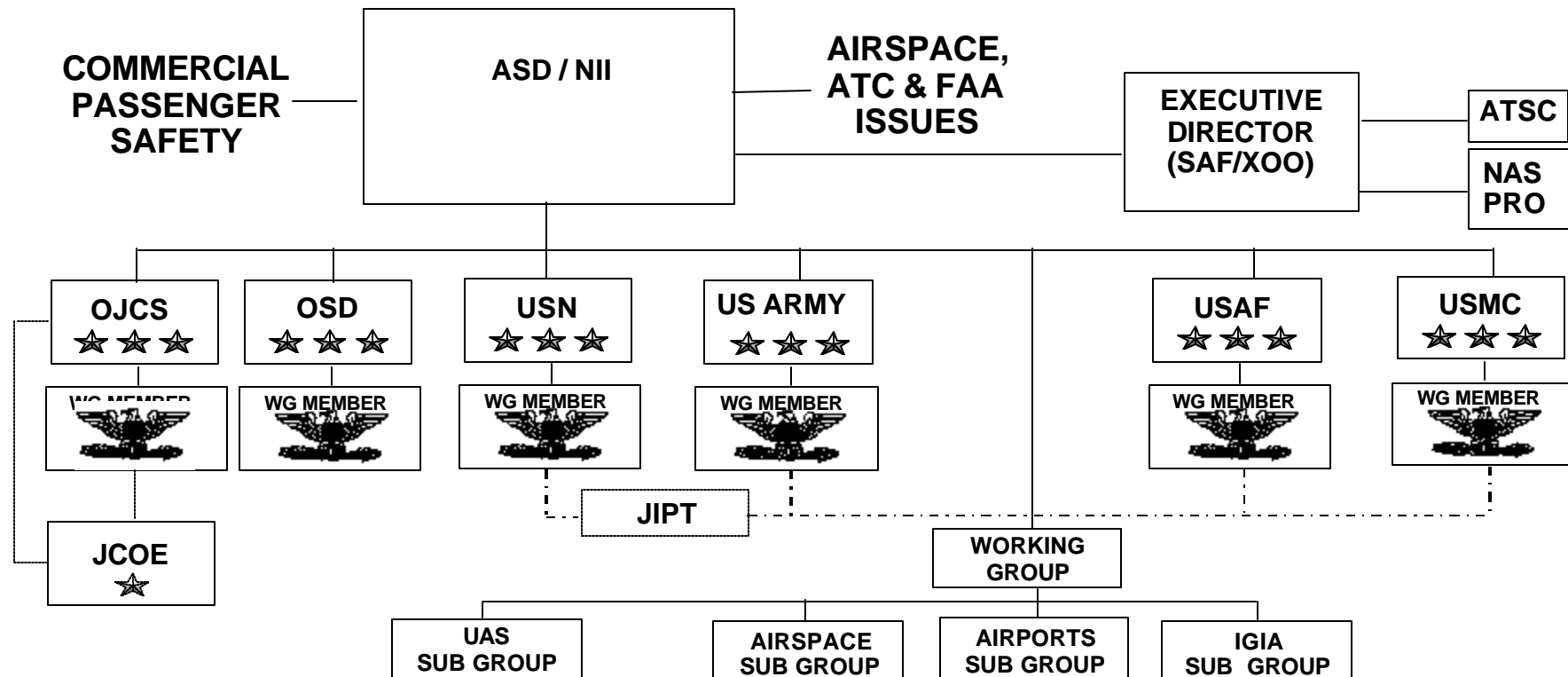
-  **Methodology – Requirements / Analysis / Wargaming**
-  **Study complete / Briefing through JCIDS process**

Airspace Integration

-  **FAA acknowledging importance of UAS integration by forming dedicated section at HQ in DC**
-  **PBFA tasked as lead agency for interface between DoD and FAA**
-  **JUAS COE unique position to promote efforts of all Services to leverage manpower, money and ideas for joint effort**
-  **Demonstrating an equivalent level of safety as manned aircraft will be the key**


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DOD Policy Board on Federal Aviation (PBFA)



DRAFT PROPOSAL
Policy - PBFA
Technology – AT&L
Operational Issues - JCOE

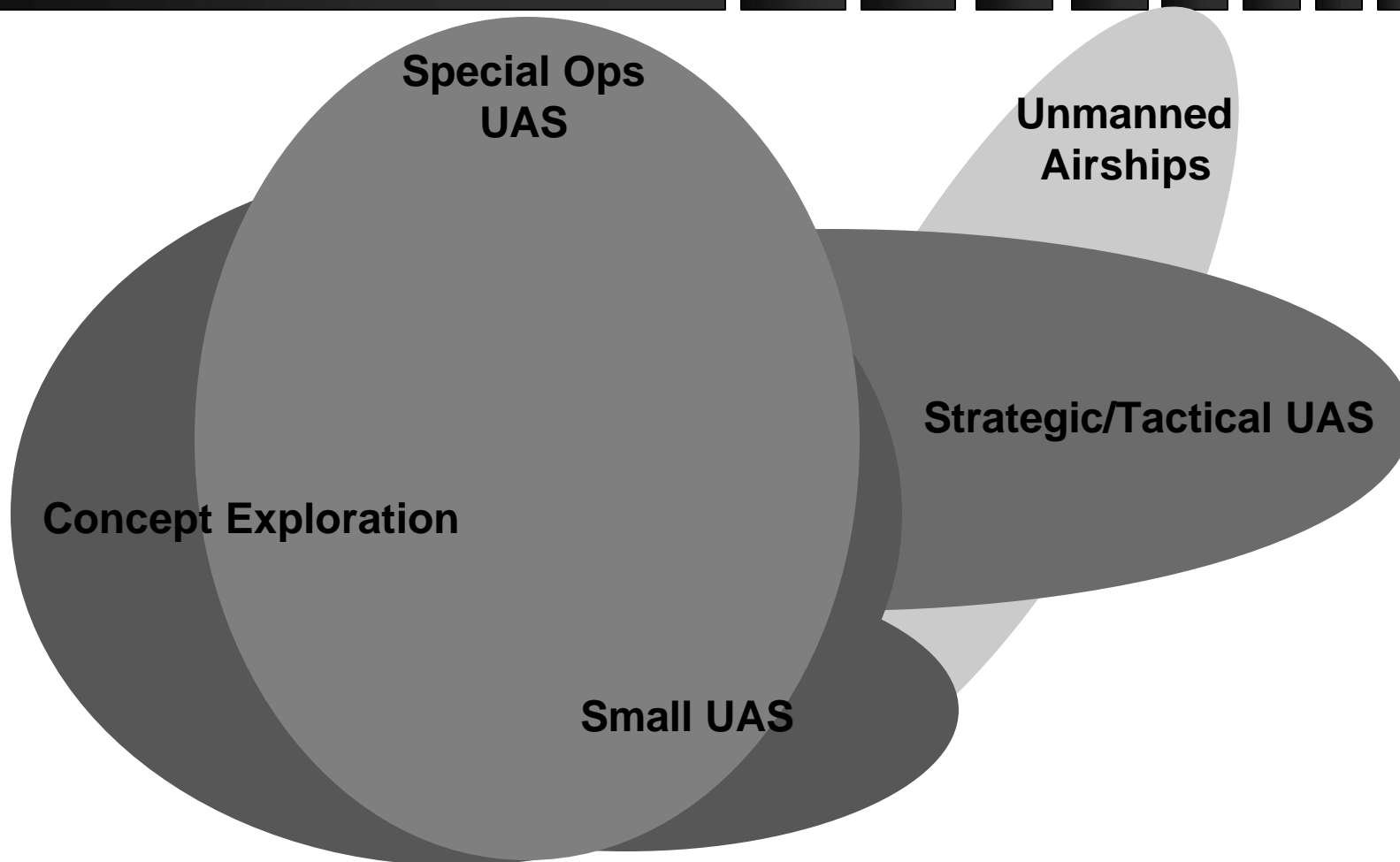
Doctrine and Training Division Update

- 
- ✍ **Tactical Employment of UAS MTTP – ALSA Publication**
 - ✍ **Signature / Release – 18 Aug 06**
 - ✍ **Transition of document to JUAS/COE**

 - ✍ **JCAS ESC Issue #9 – UAVs in JCAS Operations**
 - ✍ **Current: Adjudication of JTTP UAS Focus Group comments**
 - ✍ **Sep 06: Projected completion of JTTP UAS Working Paper and change of applicable Joint CAS publications**

 - ✍ **JROCM 197-05: Joint Overarching CONOPS Development**
 - ✍ **Three CONOPS Working Groups Complete**
 - ✍ **Initial CONOPS document complete – 30 Sep 06**
 - ✍ **World-wide review / Adjudication of Comments – Oct - Dec 06**
 - ✍ **Submission for CJCS approval – 10 Jan 07**

UAS Relationships in DOD Schema



Proposed NAS UAS Levels



<u>Category</u>	<u>Airspeed (Kts)</u>	<u>Weight (Lbs)</u>	<u>Operating Altitude (AGL)</u>
L 0	< 250	< 2	<1,200 BATCAM
L 1	< 250	2 - 20	< 3,000 Raven / Pointer
L 2	< 250	21 – 1,320	< 18,000 Shadow / Scan Eagle
L 3	< 250	1,321 – 12,500	< 18,000 Hunter / Predator
L 4	> 250	< 12,500	< 18,000 Killer Bee
L 5	UNL	> 12,500	> 18,000 Global Hawk

Proposed DoD UAS Categories


<u>TYPICAL USERS</u>	<u>JOINT CATEGORY</u>	<u>OPERATING ALTITUDE</u>	<u>LAUNCH METHOD</u>
TACTICAL SOF/Small Unit	T 1	<1000	Hand Launched Raven
TACTICAL Batt / Brigade	T 2	< 5,000	Mobile Launched Scan Eagle
TACTICAL Division / Corps	T 3	< 10,000	Conventional / VTOL Hunter
OPERATIONAL JTF	O	< 40,000	Conventional Runway Predator
STRATEGIC National	S	> 40,000	Conventional Runway Global Hawk
AIRSHIP National	A	UNLIMITED	VTOL JLENS

DoD / NAS UAS Categories



Joint UAS Categories		Domestic Use UAS Levels
Tactical 1		L 0
		L 1
Tactical II		L 2
Tactical III Operational Strategic	Airships	
		L 4
		L 5

JUAS COE Priorities

- 
- ✍ **Joint CONOPS Development**
 - ✍ **Airspace**
 - ✍ **Access / Integration into NAS**
 - ✍ **Spectrum Management / Bandwidth Availability**
 - ✍ **C2 / Interoperability**
 - ✍ **Other**
 - ✍ **Joint DoD UAS Operator Training Standards**
 - ✍ **Weaponization of UAS**

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JUAS COE



Questions?



**NDIA
11th Annual
Expeditionary Warfare Conference
Force Structure Uncertainty
Panel Discussion**

25 October 2006

**Jim Thomsen
Program Executive Officer
Littoral & Mine Warfare**

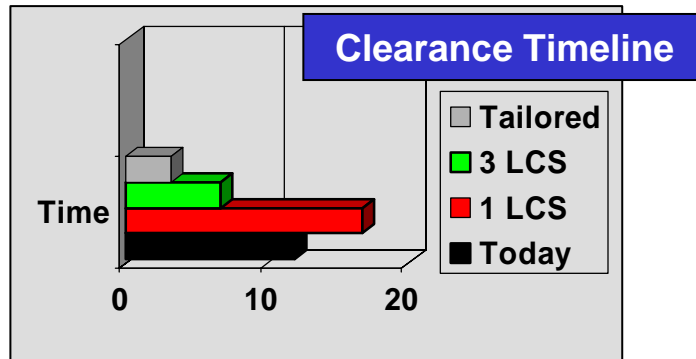
"Sustain combat readiness ... with the right combat capabilities - access, speed, agility, adaptability, persistence, awareness and lethality - for the right cost."

Admiral Mike Mullen, CNO Guidance, 2006

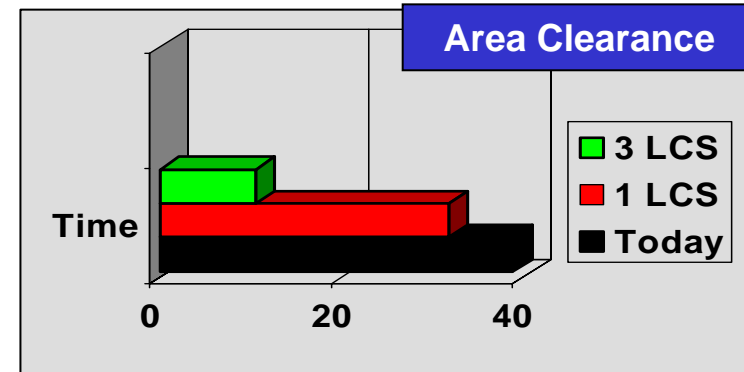


Adaptive Force Packages and Force Structure -- an LCS example

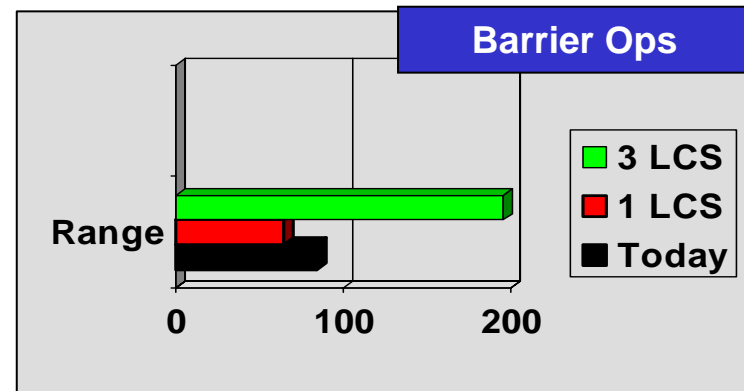
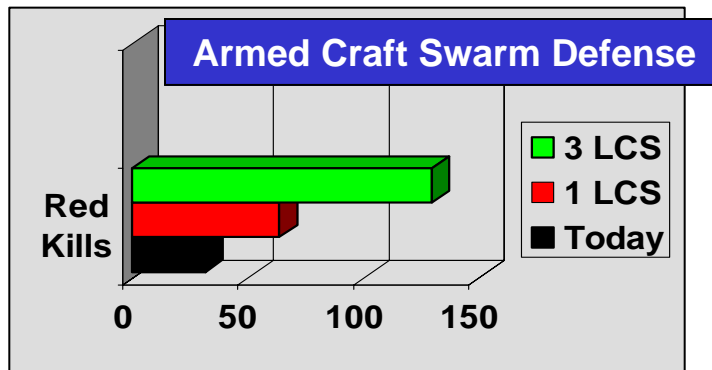
Mine Countermeasures



Anti-Submarine Warfare



Surface Warfare



"We will develop Adaptive Force Packages ... in support of operations in blue, green, and brown water environments ..."

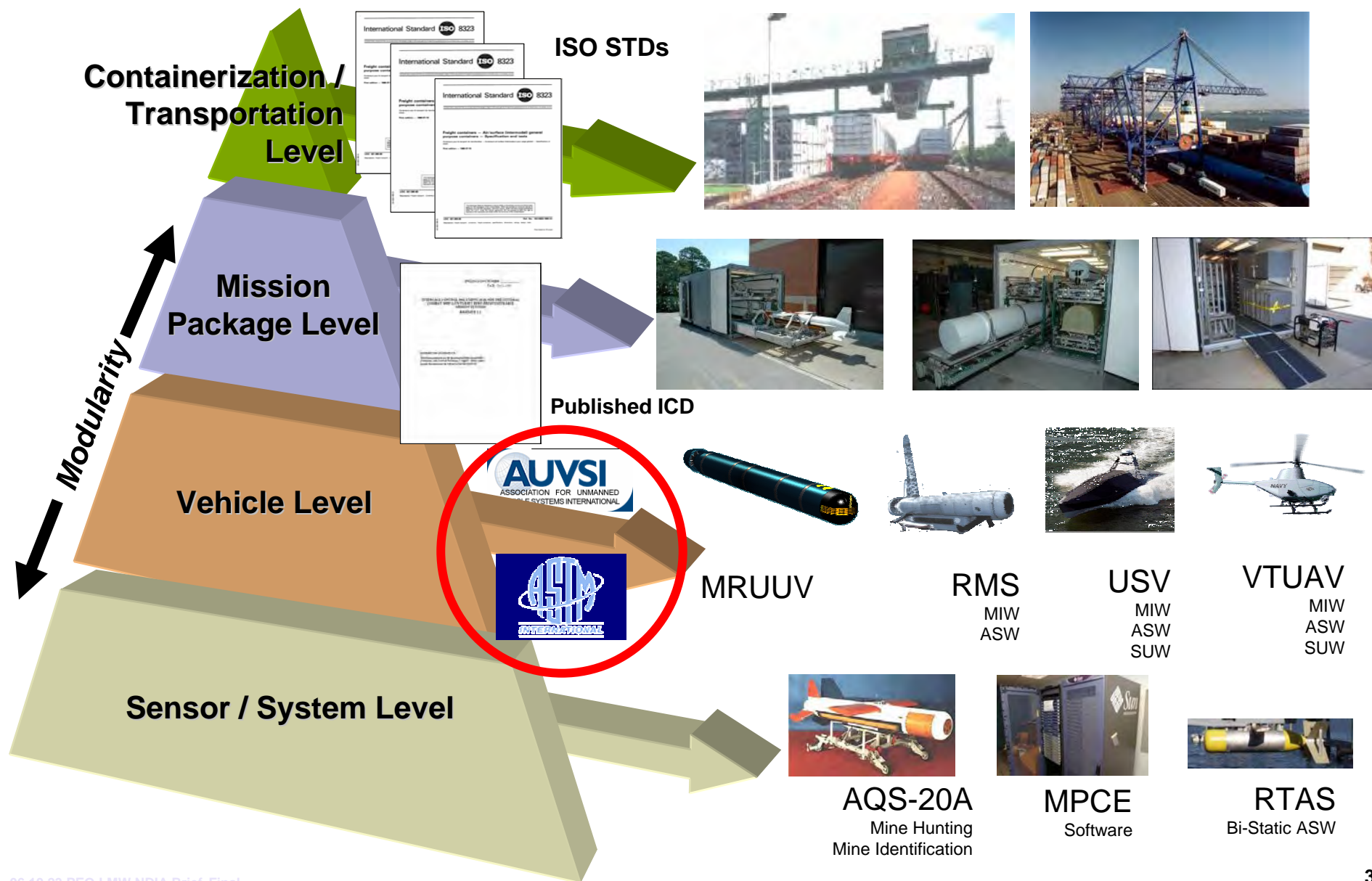
Admiral Mike Mullen --- CNO Guidance, 2006



PEO Littoral and Mine Warfare



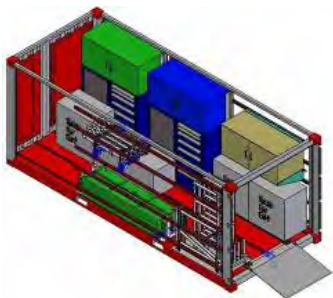
Adaptive Force Packages, Mission Packages, and Modularity



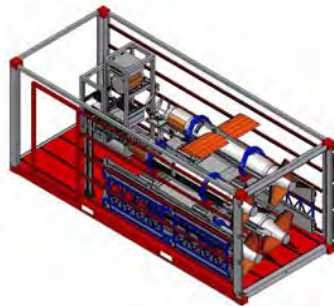


The First LCS Mission Package Realized

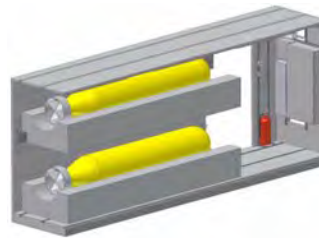
RMS



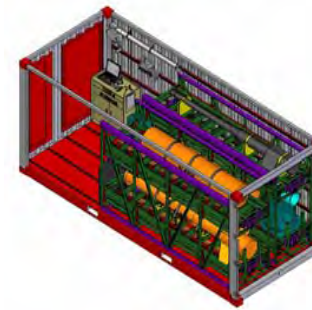
AQS-20A



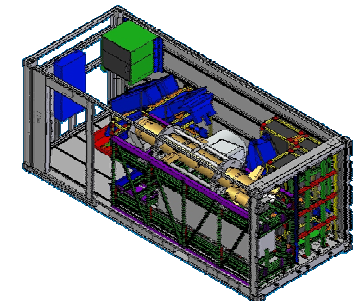
BPAUV



AMNS /
ALMDS /
RAMICS



OASIS &
Helo Mod Kit

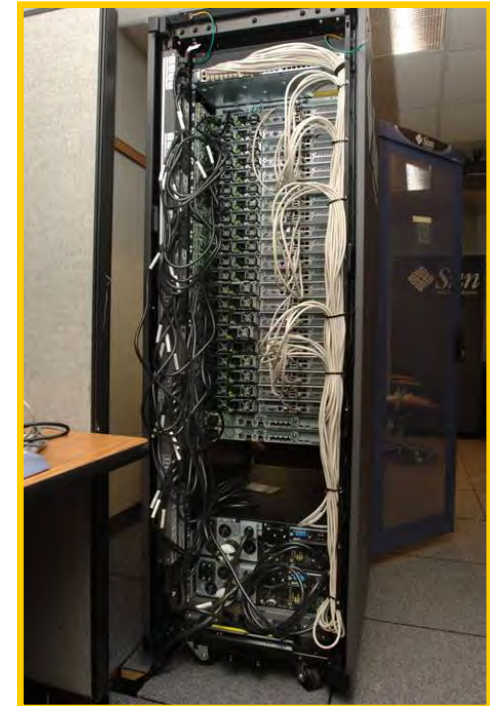
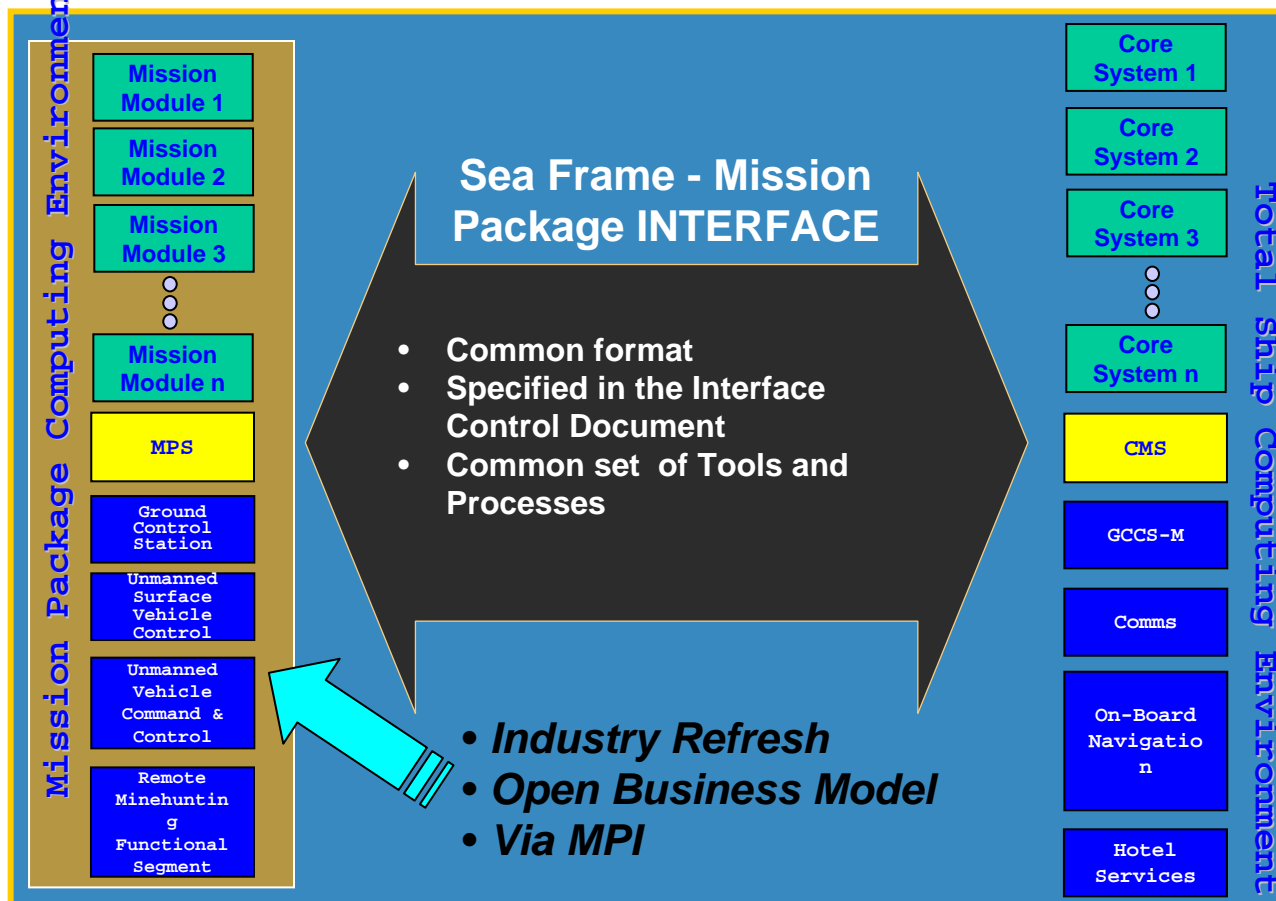




Mission Package

Open Computing Environment

- Maximum use of existing S/W – Common S/W apps with Current Fleet platforms
- MPs interface with LCS Sea frame through documented ICD
- OA Level 3 COTS H/W allows Open System model for acquisition and development

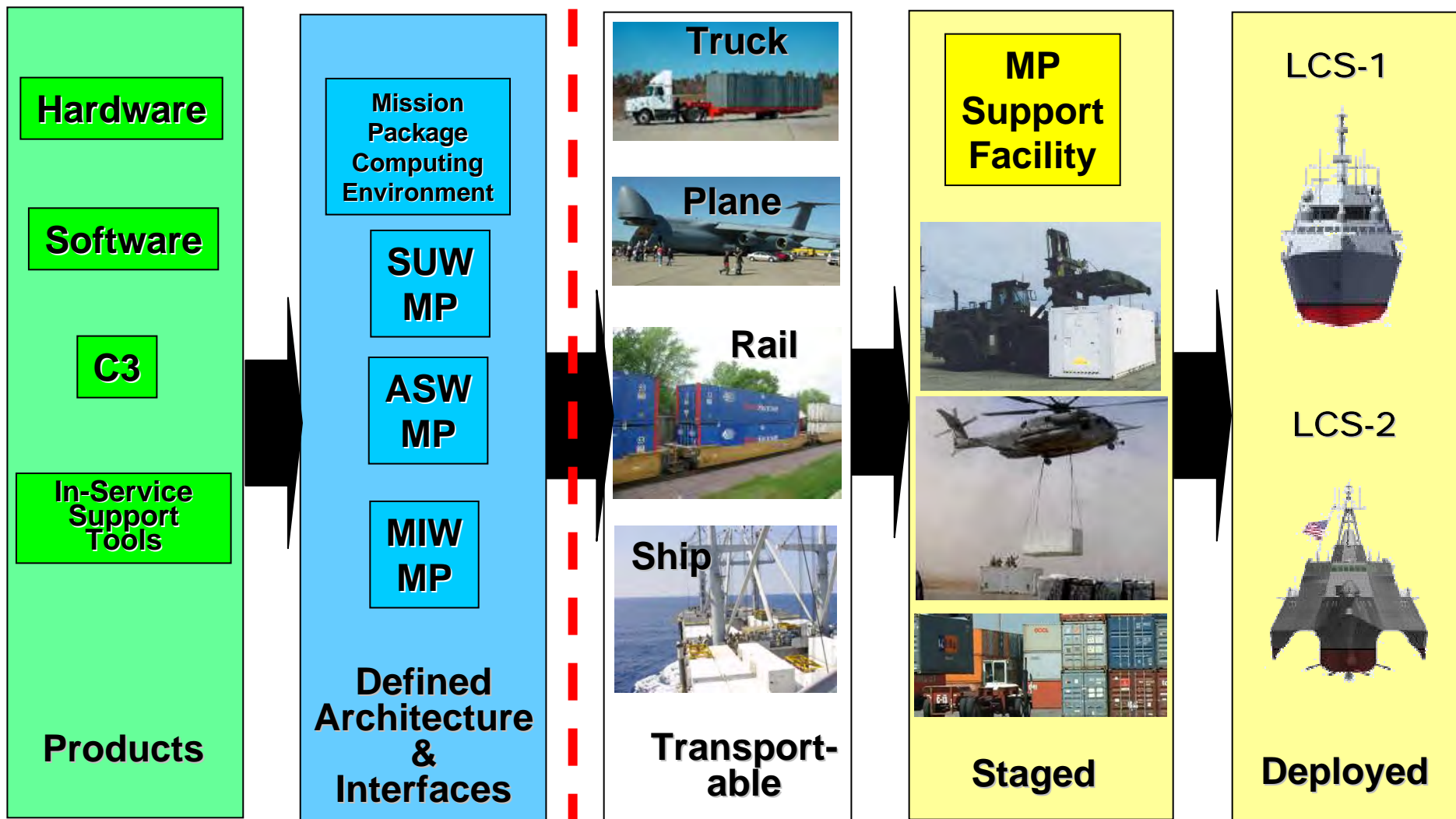




Mission Package Open Business Model

Approach

Mission Package Integrator



Spiral Development